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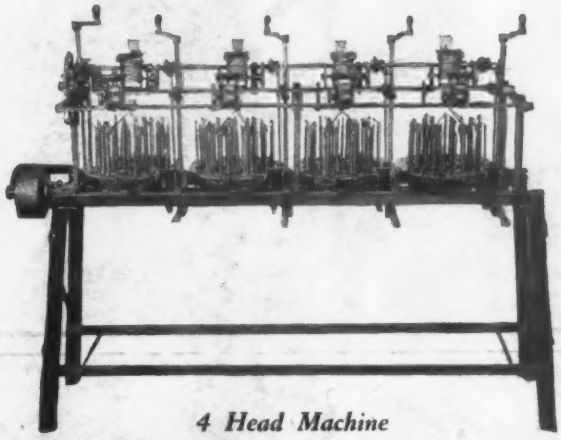

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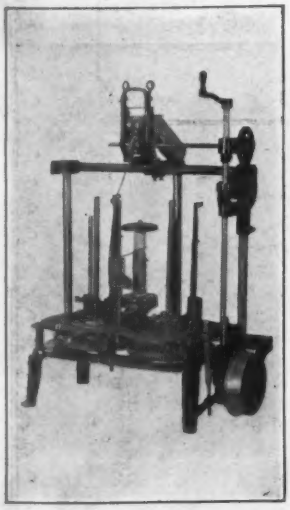

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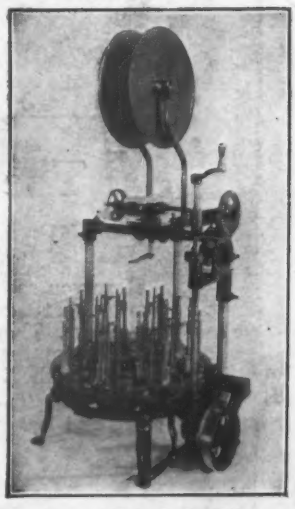

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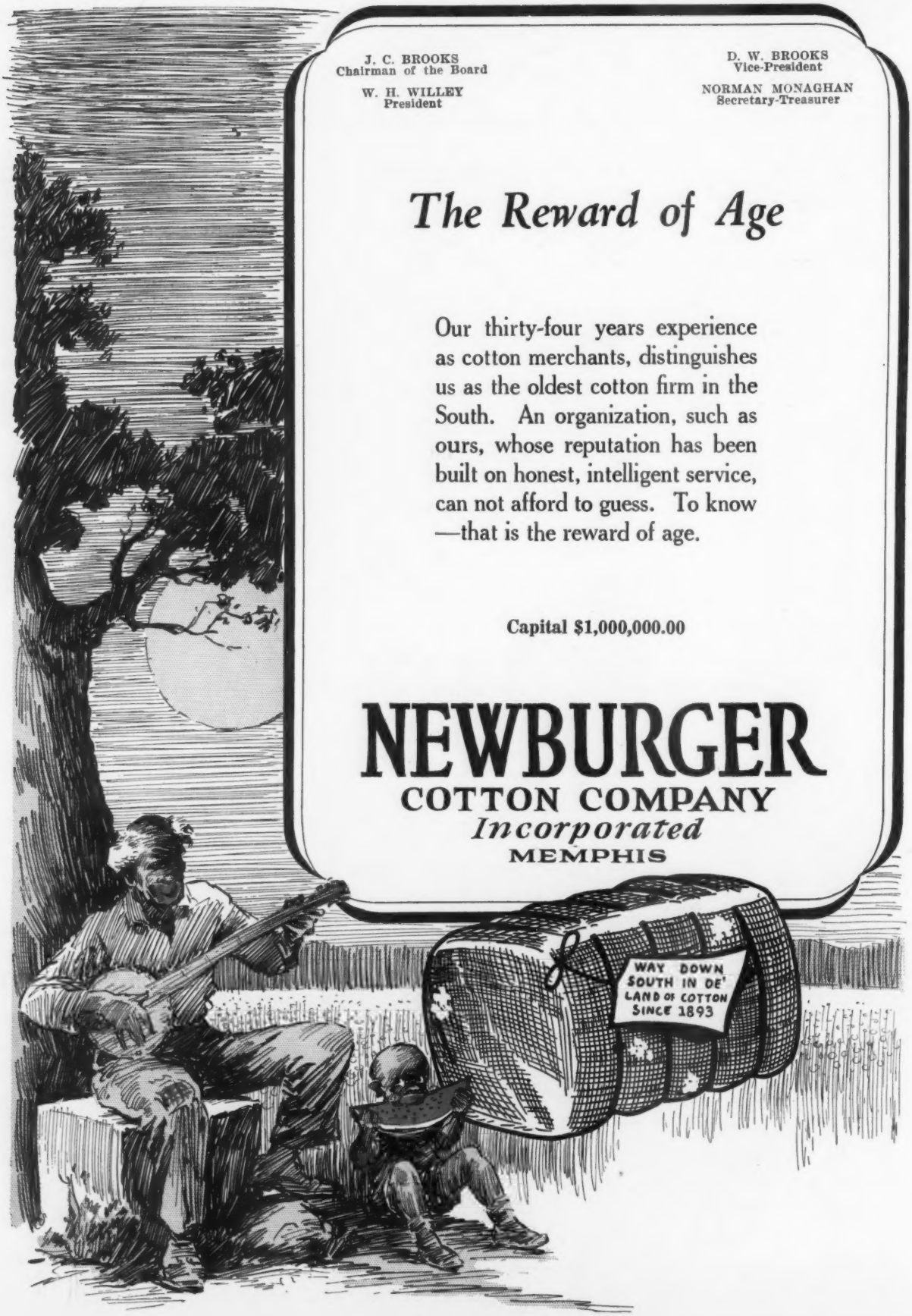


Doing Top Beam Work on Slashers

By "SCOTCH"

The slashing of yarns originated primarily for the reason that dressing machines, tape slashers and other methods of preparing warps for weaving were inadequate for the larger number of ends that newer constructions were constantly demanding, and the fact that production was very limited with the older methods. Consequently, the ordinary type of slasher of today is a rather cumbersome affair, and heavily built to withstand hard usage. True, there are certain types of one-cylinder machines that are made for light work but still they are too heavy for certain kinds of work that the fine goods mill demands.

The surprising thing is what this machine can be made to do with skillful handling; even the ordinary type of machine, if used intelligently, will handle proficiently as low as 100 ends of fine yarns. This brings to mind the question as to whether one can use a machine intelligently, or with intelligence, or is it simply skillfulness. John Knowles Milliken, manager of the Mount Hope Finishing Co., North Dighton, Mass., in a speech delivered in New Bedford recently, made the statement that "it doesn't require intelligence to run any of the machines in our cotton mills of today," so possibly we had better use the term skillfulness to avoid argument.

In New Bedford, we find it requires a high degree of skillfulness to handle the fine yarns in our mills manufacturing fancies, and we find many who cannot do fine work and cannot be trained to do it. For instance, if you were an overseer of slashing in New Bedford, and you needed a man for fancies, you would get in touch with the secretary of the Slashers' Union and inform him you needed a man. He would ask you, "What kind of a man do you require, plain or fancy?" If in need of a man to handle top beams, crepe, hard twist, regular and reverse, double box work, or pattern work, you would notify him to that effect, and he would send that kind of a man, knowing it to be useless to send a plain workman to attempt to do the work of the highly skilled fancy workman. In fact, many of the slashermen might be in the business all of their lives and still be utterly incapable of doing the fine work.

The handling of a light number of ends of fine yarn, or to be more explicit a few ends like 100, 150, 200, or 300 or more of 50s yarn on the ordinary slasher is done with a nicety and skillfulness that is good to behold, and the fact is always with us in this section that there isn't a whole lot of men able to do this class of work.

While there are different methods used in handling top beams, on fine work the divider or scallop board is preferred to any other; therefore a description will be in order. A divider or scallop board is shown in Fig. 1. This is a board the full width of the section beams, with the scallops from three to four inches deep, and is usually made of hard wood from 1¼ to 2 inches thick. The bottoms should be kept perfectly smooth as this is where the best results come from.

Dividers are made also by the use of stiff wire, even cast iron, and in a fancy mill they will run from three to twelve and fourteen scallops and even more. The best results will be obtained with five, six or eight scallops. There are some that are made to roll, but this type has not proven a success.

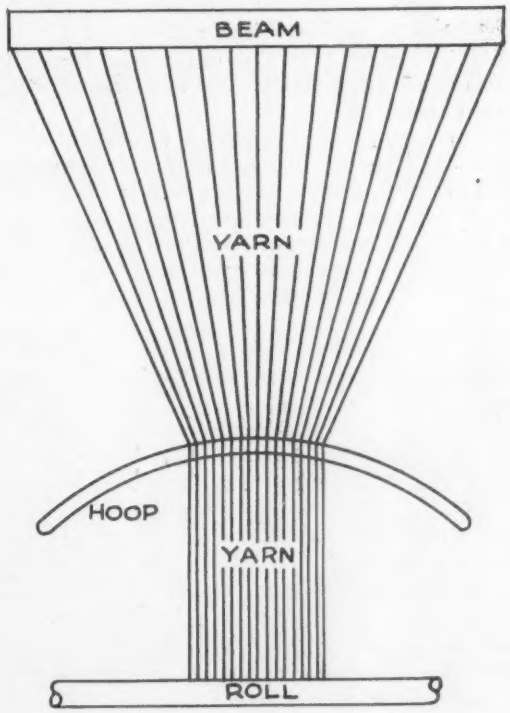


FIG. 2

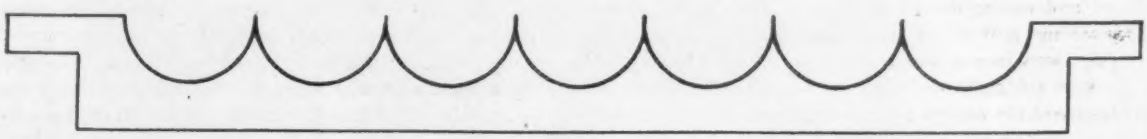


FIG. 1

It is interesting to note how and where the divider came about. Before its use a hoop style was used. The section beam was placed away back at the end of the creel and the yarn narrowed into a big single bow fitted into the sides of the front part of the slasher creel, as is shown in Fig. 2. Before this hoop shaped affair was used, our only recourse was a bow, taken from the front part of a certain style of slasher and originally used to narrow the yarn before it came up to the head of the machines. Other schemes were used occasionally, such as slasher rods put through the yarn so that the yarn ran through a V-shaped trough. There are quite a few at the present time who believe the divider should have V-shaped scallops instead of rounded ones.

Suddenly out of one of the fancy goods mills came the dividers as used today, and there seems to be nothing in sight that can do the work any better. Its handiness is astonishing, even spools can be run through without a reed, simply half lease the yarn in front of the slasher with a rod. The fact that they run this in a tape form seems to prevent some of the ends from slacking up as is usually the case when using spools.

The secret of the divider is to have the yarn run through the scallops with as wide and compact a tape as possible, getting an effect that is reed like, each thread separate as far as possible, but still so close together that a perfect tape is formed.

With a small number of ends it is usually best to have at least one lease rod dividing the yarn or threads, one up and one down, and tied in place between the beam and the roll, and some workmen prefer two rods; this extra lease works to great advantage with some grades of work.

While there is some argument as to the better way, one rod or two, the pecular thing about it is the fact that a skilled hand will give the same results without any lease at all. He will arrange the divider in such a way that the yarn will run through the scallop reed like, each thread running true, and when it arrives at the front of the slasher, each thread simply pulls away sideways from its neighbor. This cannot be done, of course, if the tapes are running through the divider haphazardly or in ropy fashion.

Possibly a few photographs showing different methods of using the divider may be of interest. The first "hang-up" shown, in Fig. 3, is for a small three beam set of 50s yarn, with about 1,400 ends. This is not for top beams, but is included because it comes under divider work. If run at the full width of the ordinary section beam, the yarn between the size rolls and the large cylinder will run tapy, because there isn't enough body of yarn to hold intact and at every stop the yarn will curl badly and break when it gets to the front rods. The divider prevents this by keeping each tape a certain thickness and the yarn cannot twist or curl.

In the second "hang-up," for top beams, shown in Fig. 4, while the final results may be very nearly the same we find that different men will have a little different way of handling the work. In this case we have two beams, one colored and one white, to be counted in and striped on the beam in front. If you will examine closely you will discover there is a one and one lease on each beam, and while it is preferable to have the beams back farther in the creel and the divider arranged differently, still a first-class job was turned off.

The photograph in Fig. 5 gives an idea of the "hang-up" for real top beam work, but the divider is not in the correct place for the best results, as the tapes have a more or less ropy effect and may cause some bother with the ends doubling in when going through the front rods. As in Fig. 4, the half lease is used, and the rod can be seen separating the threads as they come from the beam and go up over the roll.

What might be termed the correct "hang-up" for one beam with the use of the divider is shown in Fig. 6. With the beam set in the back part of the creel, and using two leases or separations, and the divider in either the first or second upright of the creel, a perfect tape can be made. In this case, if I remember correctly, 207 ends of 50s colored yarn were being made into tops of 40-inch width, and is a typical top beam job, running through with absolutely no trouble or breakage. The yarn being red photographed dark.

FIG. 3

In the handling of top beams, one must not assume from the foregoing explanations that a thorough knowledge of the use of the divider is all that is required. Far from it. The head of the slasher must be taken care of. Here again we find many different methods in use. Some throw off the friction entirely, using nothing but a band or strap running from the cone to the head of the beam. This method calls for an idler, and works satisfactorily. Some use thin wooden discs covered with flannel in the friction, being thinner than the ordinary type they work very nicely. Still others have a set of gears that can be put in place on the friction side of the slasher, reducing the speed of the beam, and still others use beams with large barrels.

Possibly one of the best schemes is to take out one side of the friction entirely, preferably the outside, remove the discs and also the flannels, take out the key from the keyway, and then put the plate back again without any friction whatever on the outside. This leaves us with only half

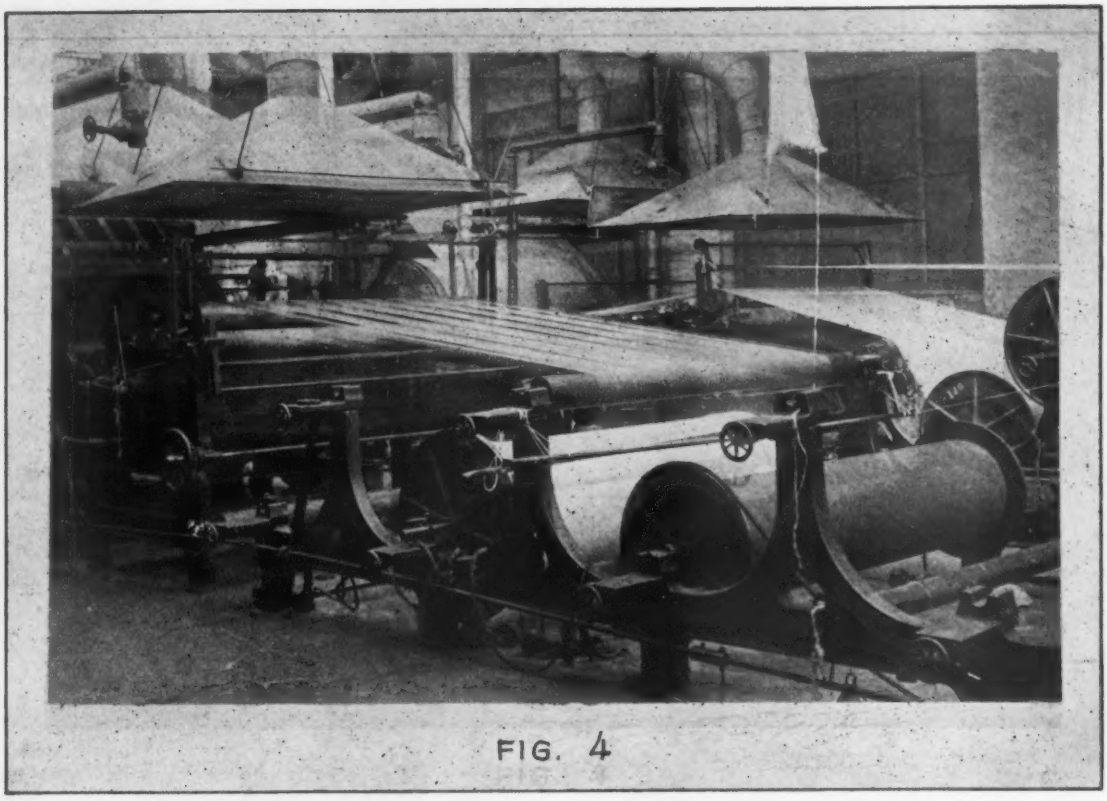


FIG. 4

a friction and then by manipulating the lever arm, changing the setting, and possibly putting in a small piece of wood on the back part of the lever, the tension of the yarn can be regulated to handle any light number of threads. On special occasions I have known tapes to be made with 59 ends of 42s yarn for entire sets of 30 or more warps.

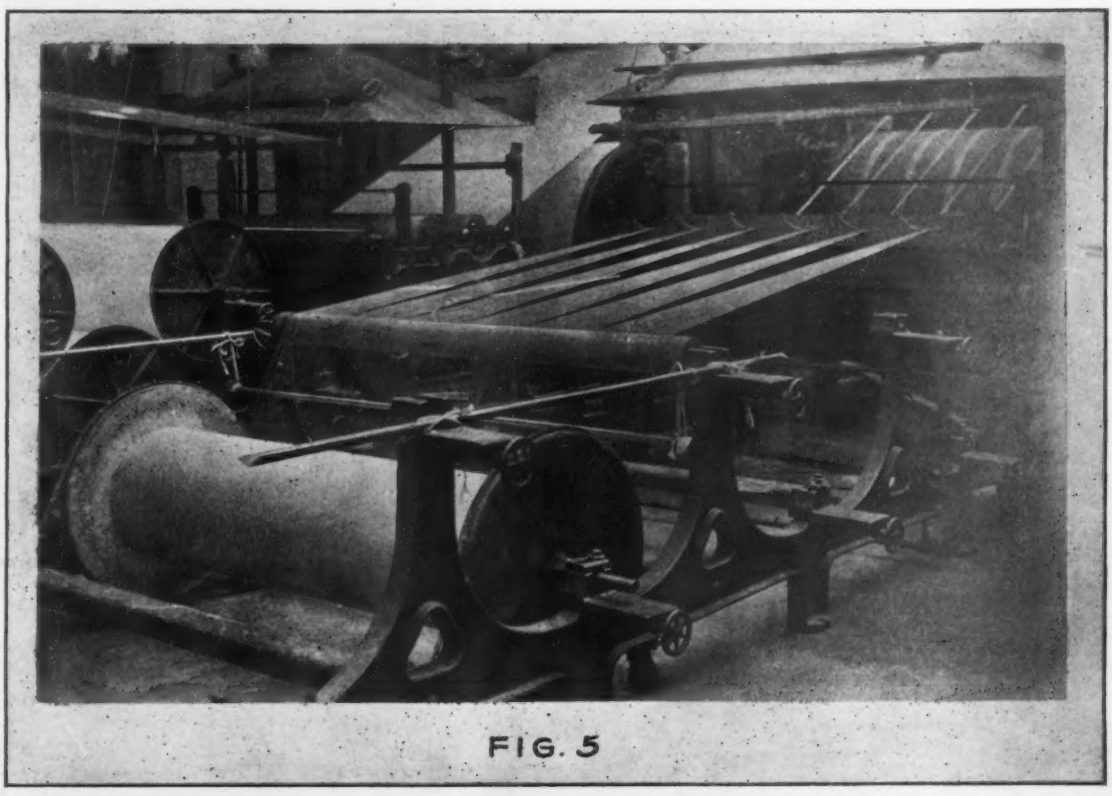


FIG. 5

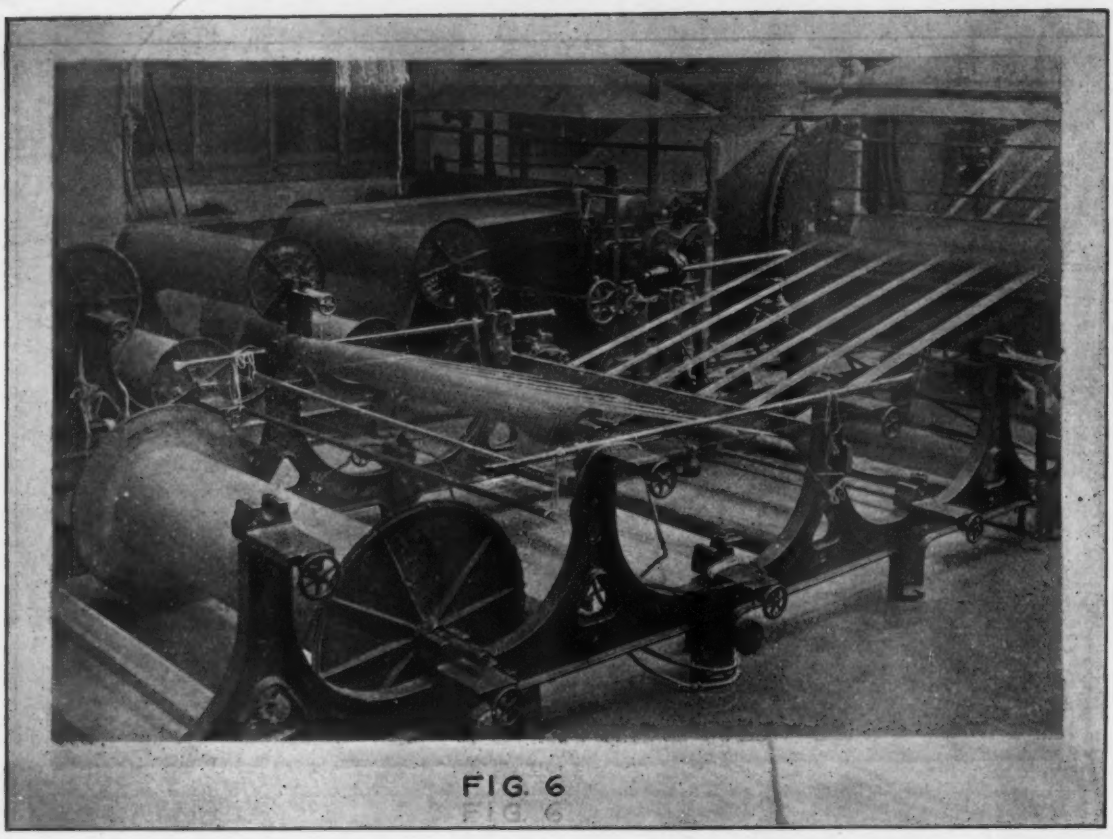


FIG. 6

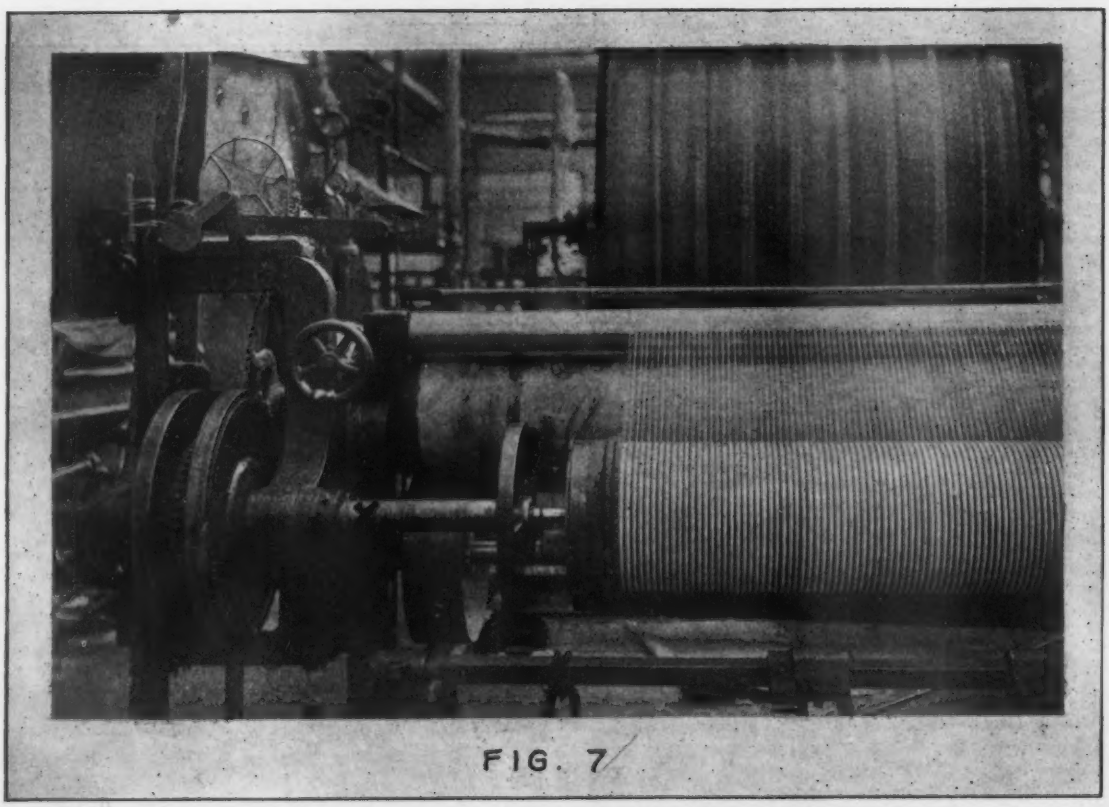


FIG. 7

There are many other wrinkles used in making top beams and the ideas embodied here are from some of the best fine goods mills.

The photograph in Fig. 7 shows the lever type of friction used in making top beams. The outside friction has been entirely removed, and the plate put back as described. You will note a small piece of wood tied in the top part of the lever as described. This is simply one of the many ways the lever tension can be changed. The method used by one of the best known mills in the country is to have a ten-inch flanged pulley bored to fit the friction arbor, and placed on the side, so that a felt-lined brake band running over the flanged pulley can be fastened securely to the head of the machine; then with a thumb-screw working through the brake-band, any tension required can be had. In this case the friction is not altered whatsoever as in the preceding case, the brake band simply acts as a retarder to the point desired. In other words, it puts a brake on the friction. From a mechanical standpoint this scheme is absolutely all right, and from general appearances the correct idea. The cross in the photograph in Fig. 7 shows the place where the pulley is set with this arrangement, and the other marks on the machine indicate where the brake bands are fastened.

Designing for Ladies' Dress Goods

By OSBERT HUGHES.

The actual designing of ladies' dress goods does not offer any really difficult problems. The weaves used, the denting in the reed, drawing-in drafts and jacquard card-stamping are all of the simplest kinds, it being very seldom that compound fabrics are made for dress goods today. However, present day conditions require the designer to be thoroughly familiar with every type and variety of pattern and fabric that may possibly need his attention. Universal colorings and color combinations, and novelty weaves are the order of the day, and only speedy marketing, coupled with prompt deliveries, can ensure even the most attractive pattern being a good seller. It is no longer enough for the up-to-date designer to follow the styles, he at least must keep abreast, or better still, a jump ahead of them, as a fabric or design that is greatly favored one month may be decidedly passe the next.

The ever-increasing use of rayon in what were formerly all-cotton dress goods has given the designer a great opportunity to develop rich and distinctive effects. Many cotton and rayon mixtures have been brought out, some using a cotton warp and rayon filling, others cotton warp and filling with rayon used as stripes and checks. Novelty twisted yarns, or cotton and rayon yarn twisted together are often used to advantage in such stripes. Warp face satins are made on a rayon warp with cotton filling.

A handsome dress goods fabric may be made by using a cotton warp and filling in a plain weave fabric of such weight and construction as may be deemed suitable, and introducing stripes, both warp and filling way of rayon. The rayon may be woven in plain weave with the rest of the fabric, and where the rayon warp ends and filling picks intersect a different effect, such as a weave which will float the rayon, may be used. A great many weaves may be used to advantage in this spot, such as the 2 x 2 basket, a satin or twill, or a dimaond, or if the spot is not large the warp and filling may float solid in alternate spots. This arrangement gives a very attractive spot figure effect especially if two colors of stripes are used. A suitable warp layout for such a pattern may be as follows:

Thirty ends white cotton; 6 ends blue rayon; 30 ends white cotton; 6 ends tan rayon, and the filling to balance. Or the rayon stripes may be floated on a 2 x 1 or 3 x 1 twill, the 3 x 1 twill being the most suitable as it will fit in the plain weave ground the best. Rayon stripes also look well when in a 2-end cord, the filling rayon being bound every two picks to correspond. Interesting over-check effects may be developed by using smaller stripes or cords of cotton, crossing the wider rayon stripes. A suitable warp layout for such a pattern is as follows:

Eight ends blue rayon; 20 ends white cotton; 2 ends tan cotton (as cord); 2 ends white cotton; 2 ends white cotton (as cord); 2 ends white cotton; 2 ends tan cotton (as cord); 20 ends white cotton. The filling to be run to balance for the over-check effect. The writer has always found it advisable when making up samples of these

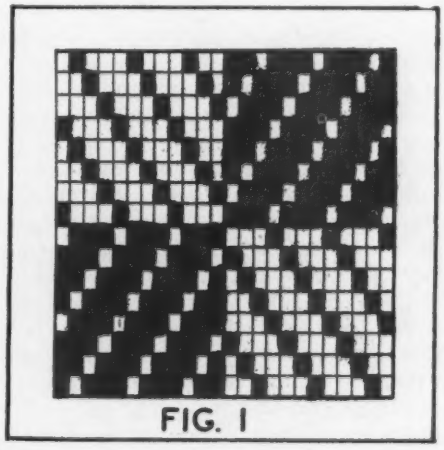


FIG. 1

fabrics to use a drawing-in draft that will enable a number of effects to be tried out. Thus by drawing-in the rayon stripe of this fabric on a sufficient number of separate harnesses the stripe may be woven in with a twill, satin and fancy effect as well as plain weave, and when the pattern is finally accepted and goes into production, the drawing-in draft most suitable to the chosen pattern should be used. An endless number of variations of this construction may be used, in all types of dress goods. They form valuable additions to the average styles made by gingham mills especially.

A fine quality of rayon-filled fancy voile may be made as follows:

The fabric construction is 56 x 48, 50/1 cotton warp and 150 denier rayon filling; a solid color warp and white rayon being used. A good grade of cotton, preferably combed yarn, should be used for the warp. The fabric may be both plain weave and fancy effects combined, or all-over fancy weaves may be used. A checker-board ef-

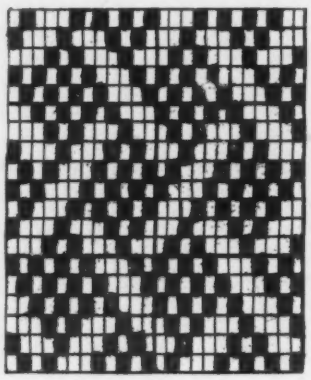
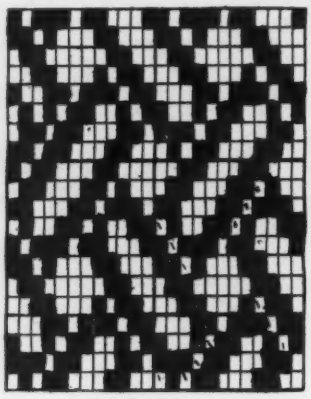


FIG. 2



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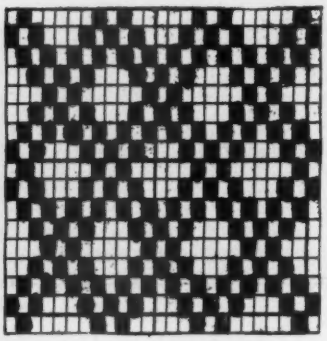


FIG. 4

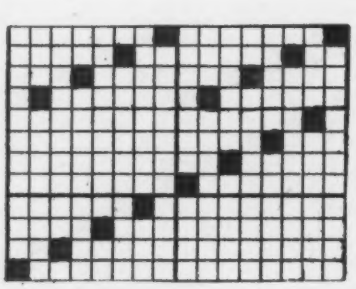
feet, using 3 x 1 twill, the checks each one-inch square and the twill running in opposite directions in each alternate square, warp float in one and filling float in the other, makes a very effective pattern. Eight harnesses for the figure, with two extra for the plain weave selvage, are sufficient for this pattern, while care should be taken to lock the two twills at their joining, as indicated in Fig. 1. If desired, a colored cord, say of 2 ends of 25/1 cotton, or of 300 denier rayon, may be introduced, both warp and filling way, at the edge of the checkers. The cord should be in plain weave, and this sets off the checkered squares making a very handsome check pattern. Another form of check pattern is obtained by using the 2 x 2 basket weave, or a mock-leno weave, in one of the squares and plain weave in the other. Basket and mock-leno weaves also look very well when used as an all-over spot figure effect, on a plain weave ground. A white or light tan warp, with patterns of colored stripes woven in plain weave, makes a good-looking dress goods fabric, as do patterns based on the Scottish Tartan effects. Figs. 2, 3, and 4 show fancy weaves that look well in this construction. It might be advisable to experiment with various counts and colors of cotton filling as well as the rayon to obtain a cheaper yet still good-looking fabric.

A ladies sport suiting of very lustrous appearance and good weight may be made up in this manner. The construction is about 80 x 48, the warp of 15/1 or 30/2 with pin stripes of 50/1 or 60/1, and a mercerized or bright colored cord, of 12/2 or 15/2. The filling is 150 denier white rayon. The pin stripe and cord are woven in plain weave, and a 2 x 1 twill face and 8 shaft satin back form the body of the fabric. A suitable warp layout is as follows:

Twenty ends black, 30/2; 1 end steel, 60/1; 20 ends black, 30/2; 1 end blue, 12/2; 20 ends black, 30/2; 1 end steel, 60/1; 20 ends black, 30/2; 1 end gold, 12/2.

The drawing-in draft required is shown at Fig. 5, and the chain draft at Fig. 6, while a sample of this fabric is illustrated at Fig. 7. Various weaves may be used to advantage, such as the 2 x 1 twill and the 2 x 2 twill, and herringbone weaves formed by reversing the twill on a point draw. The herringbone weave may reverse at the stripe, or odd effects obtained by reversing on a different number of ends, irrespective of the pattern formed by the stripes. Another useful effect is the checker pattern formed from the herringbone weaves by reversing the direction of the twills at a sufficient number of picks to form a square, a section of the dobby chain draft being shown at Fig. 8. This checker effect can be further enriched by a filling check to correspond with the mercerized stripe, the stripes to run at the edge of the squares formed by the weave. A warp layout for such a pattern, to give checkers of one-inch square, might be as follows:

Eighty ends black 30/2; 2 ends blue, 15/2; 80 ends



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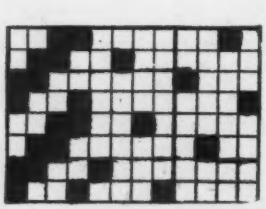

FIG. 6

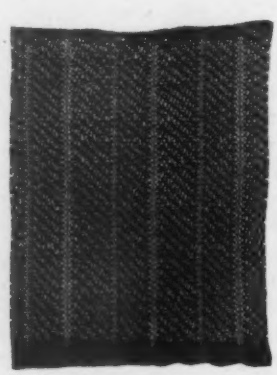

FIG. 7

black, 30/2; 2 ends gold, 15/2; and the box chain as follows: 48 picks white rayon; 2 picks blue mercerized; 48 picks white rayon; 2 picks gold mercerized.

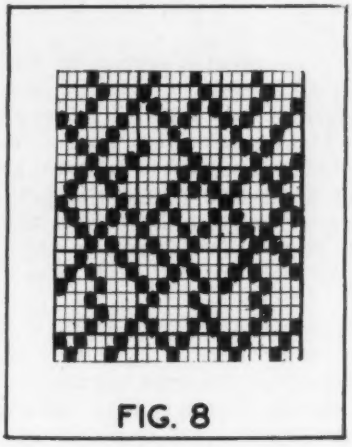

FIG. 8

Another effective weave is the diamond formation in the check formed by the mercerized. If desired, a plain twill fabric, of lighter weight and cheaper cost, may be made by dispensing with the satin back. A plain weave selvage of about 1/2-inch width is used for these goods.

On jacquard dress goods the weaves most commonly used are plain weave, the 5- and 8-shaft satins, and various twills, diamonds and fancy effects as bindings. Care should be taken when designing to lock the satins and twills on ground and figure as much as possible, as this gives a much cleaner edge to the figures. In places it may be necessary to break the weave to do this. On fabrics using a plain weave ground it is customary to bind the figures with 3 x 1, 5 x 1, 7 x 1 and other weaves repeating on an even number of ends, as such weaves fit in the plain weave the best and are also simpler for the card stamping. Various broken or "oatmeal" weaves are quite popular for bindings on figured dress goods, especially when a satin weave is used as a ground and satins and twills for the more prominent portions of the pattern. One such weave is illustrated at Fig. 8.

Modern Management

BY LUTHER H. HODGES AND HARRIET L. HERRING.

The article below is one of a series which has to do with the fundamentals of business, or, more properly known as Industrial Economics. These articles are being published from month to month. Each one is a unit in itself, although forming an integral part of the entire series.

Practical mill men like practical material and these articles are designed to meet the needs of textile operating executives who are interested in knowing more about the laws governing business and industry. The entire series has already been used by a large cotton mill organization in the South in its educational work, and this organization found the material to be very practical and effective.

Each article lends itself to discussion by groups of mill men, as well as being helpful and interesting reading. Naturally the articles are brief and in attempting to cover this large field, only the most important points have been considered.

Location and Lay-Out of Buildings and Machinery.

Choosing a mill site is a vital matter in the future prosperity of the business. There are many factors to consider if the most economical production and at its lowest cost is expected. In past years many mills were built that laid little or no stress on the natural and economical advantages, but mills which are being built at the present, and particularly the larger ones, are giving a great deal of thought to this particular subject.

Naturally when one thinks of choosing a mill site the first thing that comes into his mind is, "Where will be the ideal site?" He does not look at the subject in regard to just its natural advantages but he combines all. There have been men who have chosen the location of a mill because it was situated in an industrial center, giving very little thought to the nearness to the raw material, source of power, climate, cheapness of power and the fertility of the soil. On the other hand there have been men who have chosen mill sites just because of natural advantages, giving very little thought to the nearness to consumers.

A. M. Wellington, an economist, has laid down the rule that the best location for an economic unit is the one which yields the largest difference between capitalized cost and where the results that are most valuable can be achieved with the least outlay. The costs which should be kept in mind are not simply the individual or internal costs of a mill but the entire chain of costs involved in bridging the gap between the supplies of raw materials and the consumers of the finished product. Therefore, a mill should be placed, not where the manufacturing costs are least, but where the sum of the costs for raw material, transportation of raw material to the mill, manufacture, selling and the transportation of the finished product to market, will total the smallest possible sum.

The cost of raw material depends not only upon the crude resources which are to be exploited but upon the local cost of labor, capital and management. The cost of the four economic factors, land, labor, capital and management will, in turn, depend upon whether there is an abundance or scarcity of the things required in order to maintain a satisfactory standard of living.

The resources which result in making most regions prosperous for cotton mills or any other establishment are: 1st, fertile soil; 2nd, an adequate climate to provide cheap food; 3rd, good power, whether it be electric, steam or water; 4th, an adequate structural material to make the cost of housing moderate.

A mill located where the soil is fertile and climate temperate will have a decided influence on the cost of living. A healthful, invigorating climate will naturally affect the so-called living conditions, that is, from a standpoint of health of the employees.

Cotton mill centers have a direct advantage because of the flow of skilled labor, while on the other hand, they have a disadvantage because of labor troubles. Mills located in the same section have an advantage in the form of cheap power because of the great amount of power that is consumed. We are speaking mainly of hydro-electric power. Years ago mills were usually situated near some stream in order to use the water for power, but today the hydro-electric power, which is transmitted over high tension lines, has made the question of power (not considering the elec-

tricity which is generated by water) a thing of the past. This fact has made possible mills in localities where they would, in past years, have been a failure.

Transportation is a subject which should not be forgotten in the choosing of a mill site. If a mill is built in a section of the country where competition on freight is very keen, there is an advantage because of the cheapness of the rates. Water transportation is another advantage and will usually cause a tendency to lower rates in that particular section.

After the site has been chosen the next step is the construction of the mill. Mills are designed and built for the manufacture of a particular kind of fabric and are constructed to receive the machinery necessary for the various operations of manufacture. Two important factors that should be borne in mind are the economical production of goods and structural firmness. Economy of production is obtained by having the various processes follow in succession so that a continuous journey is made from the raw material to the finished product.

Years ago mills were built with little thought as to the economy of the structure. It was thought wise to have a mill from three to five stories high or even higher. Today, modern mills are directly the opposite and the reason for this is that lost motion is eliminated, and instead of carrying the material which is in process over the same route several times it is carried but once from one process to another. Another advantage of the one-story building is that all of the machinery is on the ground floor where it is held firm; this eliminates the vibration. Light is more easily obtained in a one-story building.

We cannot say that the one-story building has all of the advantages because it has not, but the advantages it does have will more than offset its disadvantages. Some of the disadvantages are the floor space covers a larger area and that the problem of distributing the correct amount of heat becomes more vital, particularly so in the spinning and weave rooms.

A warehouse for the storage of raw material should be as near as possible to the opener room; adjoining the opener room the picker room should be built; adjoining the picker room the card room, so on down to the packing room. It should be kept in mind that all room waste should be done away with, but there should be enough room in order that the machinery can be efficiently installed and that the material which is going through the different processes can move freely.

Future enlargements should be given consideration, so that if any additions be planned, the system already working would join with the enlargements in the economical production of goods. The windows should be so arranged as to procure the north light which is the best for manufacturing purposes. Many modern mills are using the saw-tooth shed because of the fact that a better light can be obtained.

Modern fire precautions should be carefully considered.

Arrangement of the mill yard is a matter which should be mentioned. There should be sufficient space available so that unloading of raw material and loading of finished product can be handled efficiently without loss of time and effort.

The Planning and Routing of Work.

Four distinct things are to be considered in planning work: (1) What kind of work is to be done; (2) How the work shall be done; (3) Where the work shall be done; and (4) When the work shall be done.

Where there are several ways of doing a certain work the best thing in planning the work is to keep records so as to be able to determine the best plan. If one trusts too many things to memory some may slip from him at the time he needs them most.

There have grown up in some plants what are known as planning departments concerned in planning production, scheduling the work through in proper place and time, planning to keep cost on the right basis, and keeping necessary records of time required to do certain kinds of work. There is always planning to be done in many ways and it should be done by someone who is willing to do some good honest thinking about the things to be done. He will always find that his is one of the hard parts to play in the work.

Routing of material requires a good deal of the time of superintendents or others in the capacity of supervision. Poor routing of material would overrun one or more departments or cause idleness in them. Materials in manufacturing should never travel twice over the same ground. They should move steadily, according to a preconceived plan, from department to department, from machine to machine, from workman to workman, with no doubling back or retracing of steps. Such a program saves space, time and labor.

As this principle works out in practice it may follow any one of several methods. Some one-story factories are long and narrow in construction, the departments being placed in a straight line. The raw material enters at one end and is turned out a finished product at the other. In some factories the material begins on the ground floor and moves up, the finishing process taking place on the top floor.

Teamwork and cooperation is required in a plant for successful routing of material of whatever nature it may be.

Cost Finding and Accounting Efficiency Necessary.

The importance of efficiency in business organization has never been so generally recognized as at present, and the subject presents an even greater field for development in the future. The ultimate causes of this are to be found in the broad field of economics. The gradual absorption and development of natural resources, the exploitation of new fields of commerce, the increase of population, the higher standards of living and greater complexities of demands in modern life—these are but a few of the innumerable influences reflected in the industrial life of today.

Transformed to some extent, these changes meet the manufacturer in the form of demands for more wages and better labor conditions, in the increased cost of materials, and much keener competition in every phase of manufacturing and selling. He must either adapt his methods to meet the situation or retire from the field.

Only one practicable road lies before him and that is a keener realization of the existing possibilities in the business. To be specific, he must eliminate waste of every kind, and plan to increase the production per unit of cost, which is another way of saying he must introduce efficiency methods.

General Functions of Cost Accounting.

Any good cost system, properly operated, performs two distinct, though related, functions. The first, which is called the first function, is that of ascertaining accurate cost. The second, or indirect function, is that of supplying, in its

system of reports, the information necessary to organize the many departments of a factory into working units and to direct the activities in accord with some definite plan.

The functions performed by a cost system with respect to increasing the efficiency of a plant from the organization standpoint may be noted under the following heads:

(1) The records provide for a perpetual inventory, and also for the preparation of monthly or quarterly statements showing the financial and industrial condition of a company.

(2) The cost of each article or class of product being separately shown, the management has invaluable data at hand to guide in making changes of policy methods.

(3) Comparative costs for different periods and under different conditions are obtainable.

Advantages of a Cost System.

The records provide for following the material from the raw state until it is a finished product, and ascertaining the time, labor and expense involved in its manufacture. In this way losses of material, wasted time, defective work, poor foremanship, and various other "leaks" are detected.

A cost system supplies the information necessary to standardize the work of a plant and improve its methods.

Cost records serve as a guide for selling and pricing goods. They also place the employer in a position to get a safe basis, independent of the judgment of the foremen of the different departments, on which to reward the diligent worker and get rid of the lazy.

Industrial Relations.

If the progressive manager is to succeed in handling his enterprise for the best interests of all concerned he must give a great deal of attention to the matter of his labor problem. He should consider his workers; first, as producers, and secondly, as fellow-beings. No wise employer can disregard the human side of industry since it is one of the most important factors in the industrial structure. Labor is not a commodity, but a human service that has a voice in how it shall be used. "Men do not exist for management; management exists for men," says Henry Wood Shelton.

Selection and Placement of Workers.

Every industrial establishment of any size should have an employment department. The prospective employee should be given a preliminary and also a final interview. Those who come into personal contact with applicants must have a sense of the importance of the hiring process not only to the management but to the worker. Most employment departments give character, intelligence, trade, and special abilities tests.

After careful hiring the worker should be placed on the job for which he is best fitted. Careful follow-up methods for the new worker are essential. The largest percentage of labor turnover occurs during the first three months of employment. The employee at the outset needs friendly advice and attention.

Productivity depends largely on the proper training of the workers. There are three methods of training. There is the work that can be done by the public schools; there is the work that can be done in the factory by the corporation; and there is the work that can be done by the cooperative efforts of the corporation and the community. The manager should be interested in seeing that the young children in the community are given a good general cultural as well as a technical training in the schools. Corporation training aims to give specific job instruction; training for trade mastery and craftsmanship; and general education for those who missed school training. Special classes, lectures, correspondence courses, libraries and educational trips are some of the means used for training workers. There are also special classes for training leaders in the plant.

Promotion, Transfers and Compensation.

Promotion is the means of appealing to the worker's pride of work, mastery or desire for advancement. Promotion is the goal toward which the ambitious employee works. Good methods of promotion are essential for developing initiative and fostering a spirit of loyalty. When a worker is not fitted for his job he should be transferred to one for which he is suited. Every worker should feel that he will be treated fairly in the matter of promotion and transfer.

In the matter of wages we have the employer's point of view. They are: (1) paying the going market rate; (2) paying enough more than the market rate to buy greater interest and create an incentive, and (3) paying in relation to such factors as the cost of living, years of service, and profits of the business. The employee's attitude is: (1) that the worker will do as little as necessary and get as much pay as possible; (2) that if more than the market rate can be obtained, more work will be done; (3) that the worker wants real human satisfactions out of his job.

There are three distinct types of employee's organizations. They are (1) the plans of joint action of managements and their employees on councils, committees, conferences, assemblies, etc.; (2) the plan of an employee's association in which all employees are usually included, and (3) the so-called "federal plan" which proposes for each factory a structure similar to that of our Federal Government.

The benefits of shop committees are manifold. The association of the employees helps each worker to get acquainted with his neighbor. They also provide a training ground for leadership and responsibility among the workers. Responsibility sobers the worker and keeps down "agitators" and "hot-heads." Employee representation on committees is a stimulus to production as is widely testified to. In answer to a questionnaire sent out by the Western Efficiency Society, a large percentage of the factories reported that the shop committee plan had stimulated production. Committee action tends to relieve the management of the consideration of the minor problems. There is another value of employee organizations in relation to esprit de corps, morale and loyalty. Each of these words means a great deal to the operation of the factory.

Associations differ from shop committees. An association should include all the employees of a company. An employee's association becomes something personal and intimate. Employees who belong to an association of this kind are not merely working at the Bosworth factory, they belong to the Bosworth factory. A worker does not usually feel that he belongs to a corporation, but he can belong to an association of all its active workers.

Wages and Wage Systems.

The day rate is what the below-average worker wants because he is then getting the same pay the above-average worker gets. The good worker has no incentive to improve because he gets no more than the below-average. Still,

the good worker has the advantage of promotion. The day worker can be more careful and will do better work as a rule than a piece worker, but still, the day worker sometimes will "nurse the job" in order to get more work.

The Halsey premium system consists in ascertaining the average previous times of doing jobs and to offer the workmen an agreed percentage of any portion of this time they may save, in addition to the regular rate.

The Taylor piece rate system is as follows: (a) A large and clearly defined task for each man; (b) Standardized conditions and appliances to make performance in the time allotted regularly possible for a first class man; (c) High pay for success; and (d) Loss in wages and essential discharge for failure.

In the Gantt system a definite daily task is set which represents a first class performance. If a man accomplishes the task he gets a bonus, if he does not, he only gets his daily wage. Let us assume a case where the rate is 25 cents per hour and the bonus is 20 per cent of the standard time. If a workman completes a 5 hour job in 6 hours, he would receive the rate for 6 hours, or $1.50 for the job. If he did the job in 5 hours he would get $1.50. This system is really a day wage for below-average workers and a piece wage for the more efficient.

Housing and Welfare.

The wise manager strives to conserve the health and provide for the personal comfort of employees and their families. He uses every precaution to prevent accidents and ward off diseases. He gives financial aid and advice, and looks after the recreational life of the people in the community.

The problems of housing and welfare confront the management of southern textile organizations just as forcefully as some of the actual plant problems. The southern mills have to construct their mill villages to take care of the housing of their employees and, indeed, this problem of housing causes much study and a considerable financial outlay. Industrial housing has become specialized, as has many other more technical features connected with the operation of the mills. Mill managers are having to give thought to the proper type of houses for workers, the building up of community centers, the providing for a complete village or town.

In connection with housing there are other features which the mill management must consider which come under the head of Welfare Work. In many instances mill villages are built away from cities and centers of population, so it is almost necessary to have special welfare activities provided for the leisure hours of the employees. These activities are furnished almost without exception at nominal cost, if not entirely free, and are an additional drain on the finances and possible profits of the mills. However, they have come to be a part of a mill's program and most every mill does some form of welfare work, whether small or large.

Advertising and Distributing.

It is of no use to manufacture commodities or even to worry about housing, welfare and other kindred problems unless these manufactured commodities can be gotten to the consumer. All the problems of manufacturing are important and worthy of study and until fairly recently these problems formed the bulk of the manager's thought and worries. But the detail and technique of manufacturing has been mastered until the outstanding problem now is

Distribution.

President Coolidge has been giving a great deal of time and thought in recent months to the problems of agriculture. He has come to the definite conclusion after much study and worry that the farmer's problem is not one of production but one of distribution, one of marketing. The farmers know how to produce, they are fairly efficient; they work hard and long but they do not as a whole progress. Our President thinks that they should know something of marketing.

Coupled with the problem of marketing and distributing is the newer problem of advertising. It is one of the newer sciences. It has a field of its own and our modern-day manufacturer must know some of its more important features before his plant realizes "profits." Goods cannot be marketed or distributed without proper advertising and modern industrial organizations maintain advertising departments which are laid out and supervised by our "entrepreneur."

Mr. Roberts says, "Advertising has become such a definite factor in the modern marketing process, particularly of the marketing of manufactured products, that careful consideration of its uses is especially pertinent. Both the critics and the defenders employ fallacious arguments in regard to it, and the thoughtful business executive needs to be in position to separate the unsound considerations from those which are valid."

Advertising is an invaluable medium, for no kind of goods can be said to have been sold until those who have the goods are in touch with those who want to buy—not those who need but those who want to buy.

There are so many agencies that enter into the functions of distribution that it taxes the modern manager's mind to understand its intricacies. It is complex and varied. Much depends on the type of product to be distributed—whether buckwheat cakes, compacts or steam engines. It also depends on whether the distribution is among people of a single city, or the whole U. S. A. or the world itself.

To distribute means to get the product where it is needed in the *right quantity* and *quality* at the *right time* to the people when *need it then.*

There are many firms which handle their advertising and distribution through specialized organizations such as jobbing houses, brokers, middlemen, merchants, etc. These houses have specialized on these problems and are able to render service of such nature at a lower per unit cost than the firm that does the manufacturing. And yet the manager must know the general features to make and keep proper connections.

In other types of industry the problem has been partly met through cooperative marketing. This is one of the newer methods and promises to be of some real service. According to one of our leading economists, "Cooperative marketing puts ordinary marketing agencies on their mettle. Direct advertising to consumers by mail order houses and manufacturers forces regular retailers to study out new ways in which they can serve consumers better than these powerful, long-range competitors."

Taken all in all, advertising and distribution are problems most worthy of the consideration and study of the entrepreneur.

Note: The foregoing article was written by a group of students of Industrial Economics under the supervision of the authors.

Tension in Multiple Winding of Yarns

BY R. A. SONIAMAN.

PART ONE.

The most important point in multiple winding is the tension. Obviously in the winding of multiple ends for subsequent twisting into a single finished thread there must be many points that require very, very careful consideration, but that of tension is superlative.

In ply winding the object of tension is to have the several ends, strands, or threads that go to one unit wound so that each will have the same stress put on it as its neighbors—neither more nor less. In single end winding —whether the end itself is single or already plied—the question of tension is generally merely one of a hard or soft wound package. But where two or more ends or threads contiguous to one another are placed on a single unit (tube, cone, or spool, as the case may be), a variation in the tension of one will make a defective product—a corkscrewed thread after twisting looking somewhat like the exaggerated one illustrated in Fig. 1. It looks bad, and the strength is below normal.

As strength is a paramount requirement in some instances, it is needless to point out that the weakening due

FIG. 1

to the uneven tension is going to result in a monetary loss to the firm; for surely customers are not coming back after yarns or threads that they cannot rely upon.

The question then arises: how can the variation in the tension be determined or detected during the actual winding or spooling of the product so that steps may be taken to make it uniform? It is a good thing to have the fixer, section-hand, or other person who is in charge of the spooling section drilled, or trained, into the habit of daily feeling of the tensions of the several ends that make up the composite. The winders, or spooler tenders, too, should be educated to the proper feel of the tension and should be required to report immediately if they detect a variation.

Of course there can never be that fineness of discrimination in this method of tension testing as would be possible with a scientific instrument, but, nevertheless, a person's sense of differentiation in tension can be developed sufficiently for most practical purposes.

Observation of the ends will sometimes disclose an apparent difference in the pull of the threads. As a rule, it is well to be suspicious of an end that vibrates if its concomitant ends are running steadily; or, on the other hand, when several ends have a little vibration, and the remaining one is running straight, the several ends should be carefully felt out for differences in pull.

In medium and fine yarns, it is advisable to have a slight fluttering of all the ends if they travel over a guide wheel or other long-distance arrangement designed for the prevention of singles. The reason for desiring the slight vibration is that if the ends are run taut, there is always a possibility of the yarn being stretched because of undue tension and a decided variation in the tension may be going on; whereas, the slight movement of the ends indicates that no excess strain is being put on them.

There are many types of tension generators—gravity disks, brushes, disks and springs, balls (glass, steel, etc.), cloths or skins (flannels, etc.), interlacing metals, and so on. The various types will be commented upon to a greater or lesser extent.

Brush tensions also serve as cleaning agents: loose fibers or extraneous matter being caught and held by the bristles. The brushes are adjustable and a considerable latitude of variation in tension is obtainable. One danger from this type of tension is that if a worker is careless and untidy the brushes may become covered with bits of yarn which will in time be carried along with the ends and become incorporated in the latter.

Gravity disks are of various weights. Once a correct weight is found for any count or counts, it should be registered among the manufacturing details for future reference. Ordinarily, where a wide range of counts is wound, it will be found that one weight will serve several counts quite satisfactorily. The accompanying table, Fig. 2, will illustrate the above premises:

Counts	Weight of Tension Disk in Grains
25, 30, 35, 40, 45	175
50, 55, 60, 65	95

Fig. 2.

Although the given nine counts may be served perfectly well by two weights only, it will be best for each mill to investigate the matter of correct tension weights itself as there are so many factors entering the problem that a guaranteed forecasted cut-and-dried schedule cannot be made up and handed out promiscuously as the one and only schedule of weights. It will be found, however, that where possible to use it, that the scheme of using a certain weight for several counts will save time where there is much changing of counts, because the need of changing the weight for each count is not necessary.

Gravity disks must be watched closely by operatives as the slightest bit of lint, seed, etc., wedged between the supporting plate and the disk will raise the latter, be it ever so slightly, and consequently by removing some of the weight from the end of yarn cause the tension on the latter to be different from its fellow ends.

It is well to see that the disks revolve since this rotation becomes a self-cleansing action which is desirable. The threading of the ends must also be closely attended in disk tensions, since the pressure of the smooth disk on the smooth surface of the plate together with a slight rolling motion of the end will sometimes result in the latter escaping from the disk, Fig. 3, thereby, of course, removing

the tension from the end and causing uneven tension in the plied product.

One of the most common, if not one of the oldest methods of creating friction or tension is that of using flannel or a substitute. The pronounced nap gives a high degree of clinging effect which creates the desired friction. In a small way, also—when new—the flannel acts as an eliminator of short loose fibers, and bits of seed, motes, etc.

An arc-like board, covered with flannel is one of the most frequently met with of this type of tension creators. The board is generally adjustable. One of the disadvantages of this board type of tension is that it has not lat-

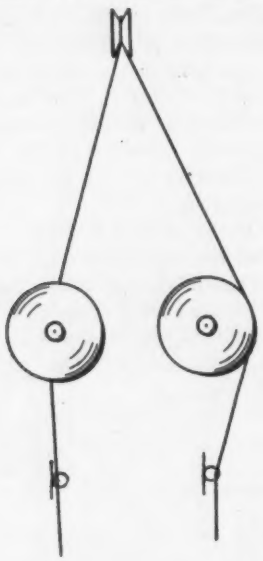

FIG. 3

eral movement, usually; consequently, the ends running over the same place continuously will in time wear grooves through the flannel, rendering it useless as a tension.

A better method of using flannel is to put it on a two- or three-inch diameter of roll, extending the length of the machine, moving not only upon its own axis, but laterally as well. It will be readily apprehended that in this case the life of the flannel will be several times that of the stationary type. In this style of tension, there is a gradual wearing away of the nap. This has no deleterious effect on the individual tension, its tendency being rather to decrease the friction of all the ends at the same time, and it generally only makes itself noticeable in the softer spool or tube that it builds.

On the other hand, when new and with a pronounced nap, the flannel may prove too great a friction or tension creator, and might cause excessive breakage of the yarn. Mills having a variety of yarns often overcome this difficulty by breaking in the new roll on coarse yarns, substituting medium counts as the nap wears, and winding up with the finest yarns when the nap has become well worn.

Coming to a consideration of the disk-and-spring tension, that is, the type in which two disks are held together by means of an adjustable, conical shaped wire spring, it may be said that this tension is not so consistently positive a tension as most of the other types of tensions when single yarns are wound. The least bit of fluff or fly, a tiny speck of leaf or mote, a nep that has hitherto clung tenaciously to the end, will act as a wedge, forcing the plates or disks apart and nullifying the tension. As it is the practice to run through a tension of its own and as the aforementioned bits of extraneous matter do not affect each of the devices simultaneously, it will be readily seen that this type of tension can become a serious menace to even winding. Eternal vigilance plus is the keyword in the repertoire of efficiency phrases of the section hand who has charge of a section of spoolers where this style of tension prevails.

The balls in the ball type of tension are made of various substances, glass, steel, etc. Therefore, even if of uniform diameter they afford a considerable range in tension because they are of different weights due to their specific gravity variation. Hence, if one kind is too heavy or too light, balls of a different material can be substituted and no change in the holder will be necessary.

When, as in using steel balls, it is desired to adhere to the one type of material, a change in the size of the ball to get a different tension effect must be accompanied by a change in the holder. Where changes are somewhat frequent it will be found more economical to have a spare set of the tensions already fitted to their holders and to the retaining board. Then the matter of changing is merely that of removing a few screws, taking away the board in use, and replacing by the board with the tension balls required.

To function properly the spheres must rotate continuously while the end is running. To attain this unbroken activity it is requisite that the balls be truly round and smooth. A misshapen ball will jump, pounding the end like a pneumatic riveting hammer, and causing an uneven tension, or drag. The ball may even stop rotating, which will

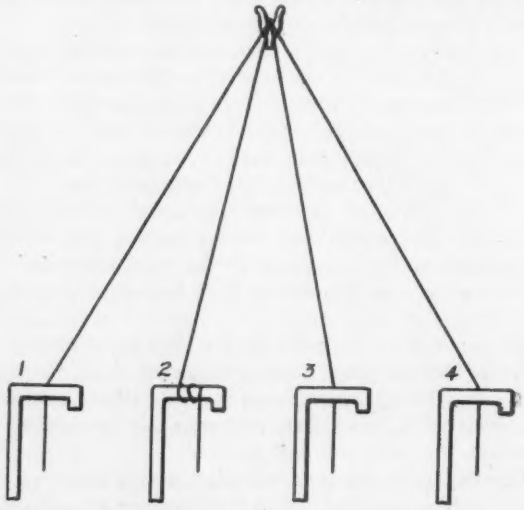

FIG. 4

still further accentuate the eccentricities of the tension, even nullifying it occasionally.

In steel balls, or let us say, heavy balls, there is a tendency for the end to seek to escape from beneath the ball. As the ball is smooth, and the bottom of the holder likewise, the least defect in the rotundity of the sphere or the shape of the holder will permit the end to gain its freedom. And of course making uneven tension!

Another style of tension is that of the interlacing finger

type. This tension is also adjustable, a changeable dead weight being the agent in the friction control. Occasionally a rod, iron or steel, is met with, here and there, in connection with tension assistants or control adjuvants. The bars, usually of round stock, are raised or lowered as the tension is to be augmented or diminished. Where the rod plays a fairly important part in the generation of friction, care should be taken that the workers are thoroughly instructed in regard to its uses. If this is not done, it will be found that should something go wrong with the tension, causing the dropwire to fall continuously, the operative will wrap the yarn a turn or two around the bar, creating a friction or tension that may be entirely different from what it should be.

The evils of this practice will be readily apprehended by a glance at the sketch, Fig. 4. Here four ends of single yarn are running to a spool. The gravity disk form of tension is used. Ends 1, 3, and 4 are working properly, but end 2 is severely out of order in the scheme of equable tension. Upon investigation, it is usually found that the offending member is either over-tensioned or under-tensioned, and of course, making an inferior product.

Finishing Linen Cloth and Toweling

BY T. WOODHOUSE AND A. BRAND.

In general, the term "finishing" as applied to textiles includes all processes that a cloth has to undergo from the time the cloth leaves the loom until it is ready for the merchant. The degree of finishing depends upon several considerations, including a most important one—the time that a customer can wait for delivery.

The processes involved in the finishing of linen cloth and toweling depends upon: (a) the length of time allowed by the merchant for the delivery of the goods from the date of the order; (b) the color of the yarns from which the cloth is to be made; (c) the degree of whiteness and finish devised by the customer; (d) the degree of ornamentation required on the towels, both during the process of weaving and after the actual so-called finishing operations.

There may be other reasons that may influence the number and extent of the operations, but the conditions mentioned probably embrace the more important ones.

The time involved in the finishing operations, the materials used, and therefore, the ultimate cost of the complete course, can be influenced greatly by the condition of the fabrics as they are received, and by the substances that have been added to the yarns to facilitate the operation of weaving. Such being the case, there should, in the first place, be some definite understanding between the bleachers and the finishers of the cloth or towels on the one hand, and the manufacturers of the cloth on the other hand; otherwise, there may be irreparable damages made that might ultimately lead to costly litigation.

In the manufacture of some of the heavier types of linen cloth and toweling, say those made of 8s to 12s line or tow yarn, both warp and filling yarn may be pretty white, say three-quarter bleached, before being wound for weaving, and consequently, the warp may be beamed in the dry state. Similarly, when union cloth or towels are made, the warp may be cotton, in which case it will probably be in the bleached state, and perhaps starched or sized, before it reaches the manufacturer; consequently, such warps will also be dry beamed, and the filling a high degree of whiteness, say three-quarter bleach, to correspond with the conditions of the all-linen cloth referred to.

If the sizer of such cotton warps gives a guarantee that all of the starching substances added can be eliminated easily by boiling or washing alone, it will smooth matters between the manufacturer of the cloth and the finisher of the cloth. In the case of the first-mentioned cloths—those made from thick line or tow warp, dry beamed—there is obviously no necessity for imparting particulars either to the bleacher or the finisher, other than stating that no starch of any kind has been added to the yarn.

On many occasions, however, both types of cloth mentioned are purposely woven from highly bleached yarns so that no boiling or bleaching—not even washing—is necessary; hence, a minimum amount of finishing is required. In some districts such cloths are designated "loom toweling" or "loom goods," a term indicating that little finishing has been done, and that the cloths are delivered in a state that differs little from the loom state of the cloths.

Again, if colored stripes, either in the warp, in the filling or in both, are introduced into the cloth, and the cloth has to be treated with liquid of any kind, the finisher should be acquainted with the approximate degree of fastness of the colored yarn employed.

There are several ingredients used to make size mixings for linen warps, but the amount of size added for those cloths that have to be bleached is only sufficient to enable the warps to weave well in the loom. Nevertheless, a number of manufacturers use special starching or sizing substances, and these substances or at least some of the constituents, may interfere greatly with the work of the bleacher and finisher. If the constituents of such sizing compounds are unknown to the manufacturer, and if he is very desirous of using them for sizing his warps, he should certainly endeavor to have them analyzed, if for nothing else but his own interests. Resin, waxes of various kinds, and the like are used by some manufacturers, and although these may improve the weaving qualities of the yarn and the appearance of the finished cloth, especially those that are dry finished, they should only be used for the latter type; on no account should these substances be used on the warps of cloths that have to undergo a process of bleaching.

Magnesium chloride is often used as a deliquescent substance, and in such cases an antiseptic, such as zinc chloride, should be used along with it to prevent mildew, or at least to minimize the growth of this undesirable fungus. If, however, much heat is likely to be developed in the finishing of the cloth, it is safer to leave them out, because there is a probability of the chlorine separating from the salts and tendering the cloth. These chlorides should also be omitted from the sizing mixtures when soaps are used as softeners, otherwise there is a danger of the formation of insoluble compounds.

The foregoing remarks are of a preventive nature, nevertheless they should be considered carefully, for there is a host of things that may cause damages to cloth between

the time that the cloth leaves the loom and the period of dispatch to the customer.

The first operation after a cloth leaves the loom is that of inspection and trimming. Different methods are in use for examining cloths. A very common method is for the cloth examiner to receive the piece from the weaver or the tuner, to check the weight of the cloth and its width at various places, count the picks per inch, or per glass, as the case may be, and, in the case of cross-bordered towels, to check the number and length of the towels, and to look over the piece from end to end, meanwhile marking with a piece of indigo yarn any defect he happens to see. All this is done on a wide, flat table, and all desirable particulars should appear in a form that the finishing operations will not destroy. These may be written on the cloth with indelible ink or else inserted by some kind of machine or hand stitching. These particulars include the loom number, running number of the piece, date, the rough width of the cloth, and desired finished width, and perhaps the weight.

The reed width of a warp invariably appears on the weavers' billet, and, occasionally, the rough cloth width appears on the same billet. This latter width, however, is

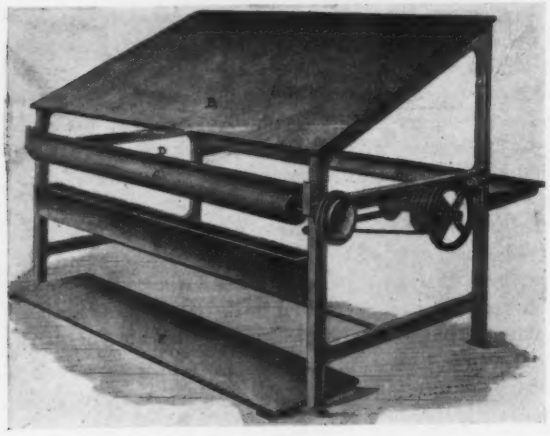

Fig. 1.

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variable, being influenced by a few conditions in the loom itself, hence, the precaution of measuring the width at various places and recording the width on the piece. This is useful as a guide to the various operatives in the finishing departments, although each one measures the width himself when any measurement is necessary. It is not claimed that the recording of the loom cloth width is general, but it is a useful term, and may serve as a guide in the various operations in case there should arise some difficulty in regard to width in any of the finishing operations.

Another method of performing the preliminary inspection is to pass the cloth over two rollers placed sufficiently high that the cloth examiner may stand between the two vertical stretches of the cloth and may examine the latter between himself and a suitable light. In this way, thin places and other defects are much more easily seen than when the examination is conducted on a table.

It is seldom, however, that the last mentioned method is adopted. The more usual plan is to use a sloping table, which may either be capable of being changed to a flat table when desired, or the sloping table may be kept in a fixed position. In many cases the piece is pulled over the board by hand, and all defects repaired as they appear on the board. In other cases, the point of each defect is marked by the insertion of an indigo thread near the selvage and in line with the defect. Then the piece is transferred to the pickers or menders; these are usually girls who also examine the piece layer by layer in order to detect anything that the cloth examiner may have missed. All undesirable lumps, such as snarls, slubs, curls, double picks and the like are removed, unless their removal would create a worse defect than it removes; all foreign matter, that is, hairpins, needles, etc., if any, are removed, and all missing short lengths, whether due to filling cutting or other causes, are sewn in, and, generally, all defects repaired, where it is possible, before the cloth is despatched to the actual finishing department.

In many places, the cloth is automatically pulled over the sloping table and stopped when required by means of a foot treadle. Occasionally the examined cloth, after having passed over the table, drops in front of the examiner and through a wide slot in the floor to a department on the lower floor.

Fig. 1 illustrates one type of sloping table; the cloth is placed on the board *A*, passed over the top of the sloping board *B*, and between the positively-driven roller *C* and the smaller roller *D*; it is then passed through the folder or plaiting-down apparatus *E*, which folds the cloth as it descends onto the board *F*.

Both simpler and more automatic boards are made; in some cases the cloth is brought in rolls and placed in a cradle below the board, and, during the examination, the cloth is brushed by rollers (sometimes on both sides) to remove loose ends and the like. Finally, the cloth is batched ready for the next operation.

(*To Be Continued.*)

Changes in H. W. Butterworth & Sons Co.

After twenty-one years as president and active head of H. W. Butterworth & Sons Company, Harry W. Butterworth, Sr., great-grandson of the founder of the textile finishing business which has borne the name Butterworth for 120 years, was elected chairman of the board of directors, a newly-created office.

The election of the former president of the company to the chairman of the board, was followed by the election of A. W. Butterworth, former vice-president, to the presidency of the company. He was also made treasurer.

J. Ebert Butterworth, formerly treasurer of the company, was elected vice-president in charge of the southern office, located in the Johnston Building, Charlotte, N. C. Harry W. Butterworth, Jr., was also elected a vice-president; he was formerly secretary. DeHaven Butterworth, who had been assistant secretary, was made secretary, and James W. Butterworth, 2nd, continued as assistant treasurer. The only other office remaining unchanged was that of vice-president in charge of the New England office. A. C. Freeman was elected to this office several years ago, and has held it since. These changes were effective July 1st.

Metz Awards for 1927.

The students awarded the Herman A. Metz prizes at the Textile High School, New York, for 1927, were: batik and dyeing, first prize, Anna Hudak; second prizes, Lena Saslowsky and Katherine Muller; chemistry and dyeing, first prize, Harry Dwoskin, second prize, Albin Bschorr.

Formaldehyde in Printing and Dyeing

BY WILLIAM B. NANSON.

Formaldehyde CH_2 is a colorless gas usually obtained in commerce by oxidising the vapors of methyl alcohol by atmospheric oxygen in the presence of an oxygen carrier usually platinized asbestos. It may also be got by heating calcium formate, which is prepared by passing furnace gases (CO) over burnt lime. Water will dissolve as much as 52 per cent of the gas but such concentrated solutions undergo a change in standing, i.e., polymerization, this resulting in the deposit of insoluble pareformaldehyde.

Commercially, formaldehyde is sold in solutions of 40 per cent strength, called formalin and is a colorless fluid of caustic taste and a pungent odor. This solution is a powerful irritant to the skin or to the mucous surfaces. It is a poison and is used as a germicide and a fungicide on plants, etc. A slight solution, say about two per cent, the vapor, or, the spray, is most useful for disinfecting rooms, clothing, etc. It is equally good for keeping food but is not allowed for such purposes. Formaldehyde combines readily with quite a number of organic substances. These produce compounds which are antiseptics and which are used locally and internally as medicines.

Thus *Urotropin*, a compound of ammonia and formaldehyde, is extensively used in diseases of the urinary tract; so are similar compounds of citric acid and which are called Citarion and Hemitol. As antiseptics used locally compounds of formaldehyde with gelatin, tannin and starch are in use.

It has been discovered that when hydrosulphate of soda is treated with formaldehyde, it yields a compound which is stable in the air, but is decomposed in steaming, and then exerts a powerful reducing action. By this discovery the use of hydrosulphite in the printing of textiles has been rendered practicable and the result has been that a great many valuable effects have been introduced.

When the concentrated aqueous solutions of hydrosulphite of soda and formaldehyde are mixed, an elevation of temperature takes place and a compound is formed which has the composition $Na_2S_2O_4$. $2CH_2O.4H_2O$ and this product comes into the market under various names, such as Hydrosulphite N.F., Hyraldite A., etc.

If the solution of this formaldehyde compound is subjected to fractional crystalization it separates into two products, viz: the formaldehyde compound of bisulphite of soda and the formaldehyde compound of sulphoxylate of soda ($NaHSO_2$) $Na_2S_2O_4$. $2CH_2O + H_2O = NaHSO_2CH_2O + NaHSO_2$. CH_2O. The pure sulphoxylate of soda has not yet been isolated. Its formaldehyde compound, when acting as a reducing agent, is converted into the formaldehyde compound of bisulphate of soda and as will be seen from the equation $NaHSO_2$. $CH_2O + O = NaHSO_2$. CH_2O has twice the reducing capacity of ordinary hydrosulphite-formaldehyde.

The sodium sulphoxylate hydrosulphite compound ($NaHSO_2$. CH_2O. $2H_2O$) comes into the market under different names such as Rongalite C. Hydrosulphite N.F. (conc), Hydraldite (conc), in the form of irregular lumps which are white or colorless and semi-translucent. When kept for some time it gradually deteriorates and gives off a disagreeable smell. It is readily soluble in water, and the aqueous solution may even be boiled in contact with the air without losing its reducing action. When printed on calico or other material, dried and steamed (especially if the steam is superheated) it acts as a powerful reducing agent and does not tender the material.

Formaldehyde is much used in a calico printing establishment to fix pigment colors. To this end the printing color is made up of glue or a solution of casein in borax and the pigment color. This is printed on, and the pieces are subsequently passed through a chamber containing formaldehyde vapor which renders the glue (or casein) insoluble in water.

If formaldehyde solution is concentrated in the presence of dehydrating agents it polymerises to trioxymethyline, a crystaline mass fusing at 171-172 C. but subliming below 100 C., insoluble in water, alcohol, or ether at ordinary temperatures, but soluble in water when heated to 130 C. when it appears to be converted into formaldehyde or pareformaldehyde. When trioxymethyline $(CH_2O)_3$ is volatilised, it dissociates completely into formaldehyde. When boiled with lime water, it yields formic acid and an amorphous saccharine substance.

Formaldehyde is capable of reacting with any class of organic, and a large number of inorganic substances and forms numerous condensation products. It reacts with hydrocarbons, carbohydrates, ketones, and aldehydes, oxy- and keto-acids and their esters, phenols, oxyaldehydes, gallic and tannic acids, amines, ammonia, hydrocyanic acid, hydrazines, hydroxylamine, urea, uric acid, guanidine, pyridine, and sulphur compounds.

One of the important properties of formaldehyde is its power of combining with ammonia to form hexamethylamine $(CH_2)_6 N_4$.

It acts in a similar way with albuminoids, gelatin, and bodies containing an NH group. If cotton (or other goods) be dressed with gelatin containing formaldehyde, the gelatin becomes very hard and insoluble on drying, and is very resistant to the attacks of bacteria. Formaldehyde does not, however, lend itself to other dressings so well, and is quickly lost by evaporation. The same result can be obtained by dressing the goods with gelatin and subsequently passing the goods through a bath of formaldehyde and drying.

When a solution of casein is mixed with formaldehyde and dried, a transparent insoluble mass is left similar to formaldehyde gelatin. Casein may be often used for stiffening and the results are usually all right. It must be first soaked in water, preferably all night or at any rate until swollen and it is then ready to be added to the dressing mixture. It is best to dissolve it (casein) in some mild alkaline solution (borax is best) before adding to the dressing. If the goods are for vulcanizing ammonia must be used to dissolve the casein. Fixed alkalis make the sizing on vulcanized goods turn brown. If a waterproof dressing is called for, formaldehyde casein *must* be used. The solution of the proteid must be mixed with two per cent of the formalin and the goods dried and formaldehyde casein is formed, or, the casein solution may be first used and the goods then run in the formaldehyde solution and dried.

Care must be taken that the free acid is first neutralized in all commercial solutions.

The commercial formaldehyde, or formalin, contains from 30 to 40 per cent CH_2O. The fastness to washing of many substantive dyestuffs is considerably increased by an after treatment with it. In addition to this it is one of the best preservatives of thickeners and dressings as it is quite effective in small quantities and has no action on textile fibers. One gallon of this mixture (40%) is enough for 400 gallons of mixing in summer and 500 gallons in winter. It should not be used in the presence of easily reduced metallic salts, as there is a tendency to produce stains in certain cases. The danger is greatest in the presence of chromic acid.

Casein is used as a paint, as a dressing for textiles, as a cement and mucilage, in the production of plastic masses, for sizing paper, and various other purposes. Since close attention has been bestowed on the insolubilising action of formaldehyde on casein a whole series of new uses have been discovered for the article, and it is no doubt destined to play a very important part in technology.

As far as paper goes, where it is necessary to provide paper with a smooth, absorbent and yet resistant surface, it is coated with a size of casein hardened with formaldehyde. Similar papers or rather casein backing without the paper are used in photo-films and they supersede the celluloid hitherto used, being free from inflammability and other objectionable features.

Casein and formaldehyde may be also coated on wall papers, making them washable and durable. In this case it is better to hang them first and coat them afterward. Brick-work may also be coated in this manner and the two together make a fine varnish.

Formaldehyde is largely used in the calico printing trade for fixing soluble colors on textile fabrics. The colors to be fixed are first printed with size or casein, the fabric being then steamed or treated with a solution of formaldehyde. The resulting insoluble compound of the latter substance with size or casein envelops the coloring matter and thus fixes it, waterproof, on the fiber.

For waterproofing a process has just come into vogue in which the fabric is treated in the cold with a mixture of casein, albumen or gelatine and formaldehyde or hexamethylenamine, then dried at 80 degrees C. and finally steamed. This printing color does not coagulate at ordinary temperatures and it is only when the printed or dyed fabric has been heated or steamed that the formaldehyde compound is decomposed, and the liberated formaldehyde combines with the size or casein to form an insoluble compound.

With regards to the waterproofing of fabrics (which is almost the same) the solution of the colloid substance may also be incorporated with pigments or loading ingredients, such as barium sulphate, these being fixed on the fiber when the albumen or casein is hardened by the steaming of the formaldehyde. Casein and gelatine are used as 10 per cent solutions, and the aqueous solution of formaldehyde is of one to two per cent strength. Formaldehyde bisulphate, which is often used, may be made by mixing 8 parts by weight of 40 per cent formaldehyde with 10 parts of sodium bisulphite or 30 B strength.

The hexamethylenamine is made from 8 parts formaldehyde and 10 of concentrated ammonia.

The use of formaldehyde or formalin in cotton printing is based on its property of coagulating casein, albuminoids, glue, etc., and rendering them insoluble. Thus formalin can be employed in printing or rather in fixing zinc oxide or metallic powders on light cotton cloth or mercerized goods. This is printed in a medium of casein and borax on thin transparent goods or on mercerized cotton goods. The fabric itself remains soft and the dull pattern in metallic or zinc white powders produces a very favorable effect by contrast with the glossy ground. At the same time the steaming fixed it (so it will stand soaping for ¼ of an hour, but this is not desired).

The casein medium for calico printing is made as follows: Six parts of casein are well stirred up with 50 of water at 120 F., and left to settle. The clear liquid is poured off and the residue is mixed (until clear) with one part of borax dissolved in 12 parts of water.

The cotton fabrics are then printed with a color made from 3½ parts of zinc white and 1½ of casein-borax medium; and the goods are afterwards steamed for 5 or 10 minutes.

In the bottom of the steamer is arranged a perforated pipe, through which formaldehyde, 40 per cent, is admitted in order that it may be vaporized in the steam chamber and fix the casein and zinc white on the fiber.

As a disinfectant it is so insatiate that it not only combines with itself but seizes upon other substances, particularly those having an aquisative nature like its own. Such a substance is phenol which is a disinfectant like formaldehyde itself and because it too has the power of decomposing decomposable organic matter and it has been found that formol and carbolic acid (phenol) in the presence of a catalyst, warmed, and in the presence of pressure, or not, results in Bakelite and all its derivatives.

The French have made great use of formaldehyde in hardening casein and have produced galalith. This is harder than celluloid and non-inflammable but has the disadvantages, we are told, of being more brittle and of absorbing more moisture. A mixture of casein and celluloid has something of the merits of both.

A series of concentration products from phenol and formol with the sulphonated oils, are, or can be made. These are formed by the action of sulphuric acid on castor, cottonseed or mineral oils. The products of this combination are white, plastic, opaque, insoluble, and infusible.

Robert Hall & Sons Acquire New Lines.

At the recent sale of Thewlis & Co. (Huddersfield) Ltd., Hoylehouse, Linthwaite, Huddersfield, England, manufacturing specialists of shearing machines for all classes of fabrics and dyeing, drying and finishing machinery for woolen, worsted and cotton cloths, plushes, sealskins, carpets, etc., the patterns of the various machines and all of the working drawings were bought by Robert Hall & Sons (Bury) Ltd., textile machinists, Bury, England.

Link-Belt Speed Reducer.

A booklet describing the Link-Belt Sykes Herringbone speed reducer has been issued by the Link-Belt Company, 910 South Michigan Ave., Chicago, Ill. The equipment, which, it is stated, is adaptable to all classes of service, is described, it being pointed out that the Link-Belt-Sykes Herringbone gears are the backbone of the device. Oversize Timken bearings are used.

CURRENT TOPICS

Presidential Timber.

Calvin Coolidge's crisp renunciation of the presidency is one of the most remarkable incidents in the history of our highest political office. With the exception of George Washington, Coolidge is about the only person who has ever refused a virtually certain tenure or the perpetuation of one in the White House. It is by no means certain that Thomas Jefferson could have reelected himself, though he was able to name his successor. Roosevelt's prospect of reelection at the close of his second term might have been as certain as Coolidge's. But it was not so at the time of Roosevelt's historic expression of allegiance to the third-term tradition. And Roosevelt would have liked to recall the statement he put forth on the night of his election in 1904, and he tried to do so in 1912.

There's a fascination about the presidential office which befuddles the minds of its occupants about their own futures and such things as hallowed traditions anent the succession to the presidency. Nearly everyone of them becomes convinced that he should be the great exception, that he should be permitted to hold on regardless of third-term precedents and all else.

It is as certain as anything having to do with the political future can be that Coolidge would have been renominated almost by acclamation. It is the opinion of most political writers that he would have been reelected almost as easily. Yet he announces that he intends to quit. Whatever the hair-splitting of the words he used that is what he meant and it is what he will hold to—and, moreover, it is what the country will hold him to. The American people have never admitted and are not likely to admit that any president, however his retention may be desirable, is indispensable.

Thus Coolidge's act makes the pending contest for the presidency a fully "open" one. In neither of the big parties does any individual loom up overwhelmingly as a presidential prospect. Charles Evans Hughes might do so were he a few years younger and less disillusioned as to all politics. Herbert Hoover might do so were he better skilled in the art of politics, for which he has almost no gift, but for which he does possess a poorly concealed contempt. Frank W. Lowden or Vice President Dawes might be an overwhelming figure in the situation but for certain and rather imponderable disadvantages.

Governor "Al" Smith of New York would loom as did Grover Cleveland a generation ago but for the religion question which affects his candidacy, and, in less measure, the wet and dry issue. It looks as if he will get his party's nomination, but largely by default, despite his mighty claims. Personality, past record, geography, all make him the outstanding Democratic prospect. But his nomination will mean the intensification of present division into a positive party split. How serious it will be nobody knows. His nomination by the Democrats will inject an element of incalculable uncertainty into the situation.

It would appear that William Gibbs McAdoo is out of the running. A man who leads and yet is defeated in two national conventions is not likely to stage a successful comeback. It looks as if the Democrats must take Smith or agree on a colorless or inconsequential "compromise," by which last their chances will be by no means improved.

What will the Republicans do? Coolidge probably favors Hoover. But will he put his prestige and power behind his Secretary of Commerce? The chances are that he will not. Western farmers are expressed as being bitterly opposed to Hoover, who no doubt is the choice of the business and industrial east.

Lowden appears to be the choice of the organized farmers of the West. But Lowden is getting along in years; he is for the McNary-Haugen heretical proposal for farm relief. He is a big business man, the dominating figure in the Pullman Company, and, except as to farm relief proposals, sanely conservative.

What the business East may look for in a Republican candidate is a happy combination of elements typified by Hoover and Lowden. In Vice President Dawes these will be found more nearly probably than in any other man. If it becomes clear that Hoover can't make the grade, Dawes may be the East's second choice. He, like Lowden, is in good standing with the farmers of the West.

Keep an eye on Dawes—a man of destiny.

There is no plethora of presidential timber in the offing. But it seems to be safely predictable that, whatever turns occur, the next president will be, in prime essentials, a "regular." Radicalism is at its lowest ebb since the war. It has no chance of becoming dominant in either party and is so demoralized that it is not likely to be able to rally notably behind a third-party venture.

The presidential campaign is apt to be, in the main, a personality contest. For between all those, in both big parties, who loom seriously as prospective candidates there is no great differense aside from personality. Hoover, Dawes, Lowden, Hughes, Longworth, "Al" Smith, Ritchie would make probably in each case about the same kind of president.

Aircraft and the Future.

A reader takes exception to statements made in this column recently concerning the present status and proved possibilities of aeroplanes and dirigibles. He quotes the following as being without warrant: "Airplanes and dirigibles still are not much more than amazing toys," "It may be doubted if any other invention was still so nearly in its experimental stage twenty years after its elementary practicability was demonstrated."

The first statement was perhaps a little strong. Airplanes and dirigibles are no doubt a good deal more than amazing toys. They do perform functions which are beyond the power of any other devices. Some of the functions are important. The carrying of letter mail at several times the speed that is possible by means of land or water transportation is one of these. The contents of much of the mail carried could be dispatched more rapidly by telegraph. Some, however, could not be. Important as it

may be in particular instances, the carrying of mail by air still is, and always may be, in the matter of volume, inconsequential. The best service that the air mail, as a whole, has rendered has been its contribution to the development of aircraft and its utilization.

To say that aircraft still is within or close to the experiment stage is an expression of optimism as to its future. Any use of aircraft that will put the air comparably on a basis with land or water as a medium of transportation depends on experiments if not developments yet to be made. It is true that the aeroplane has outdistanced Nature in some respects. One can go farther on its own fuel-carrying power than any bird, and can travel over long distances faster. But the "extra load" which it may carry is incomparable to that which is within the powers of land and water conveyances.

As a mechanical marvel, the aeroplane is without a competitor. It may be that the lessening of its wing spread, possibly the ultimate elimination of wings altogether, the development of concentrated fuels and low compression motors will make its carrying capacity comparable to that of the steam train or Diesel-powered ship.

It may be fortunate that aircraft has not come more widely into practical use pending further fundamental discoveries concerning it. For once the use of it is established, it is almost impossible to make fundamental change in an implement though incidental improvements be accepted. For example, if steam-propelled conveyances were now just coming into use who would think of putting them on steel rails instead of solid rubber or pneumatic tires?

Despite weaknesses, which, so far as known at present, are inherent, it is hardly possible for too much experimentation to be done in the realm of aircraft. But most aircraft operations should be viewed candidly as experiments, so that the door will not be closed to any discovery, no matter how revolutionary, which may be made as to flying.

Cotton's Uncertainties.

Turn to page 973 of the Federal Government's year book of Agriculture for 1926. Your eye will fall first on figures stating the average price of middling cotton during August for seven years, 1920-26. During August of the first year the average price was 37 cents a pound. A year later the average was only 12.57 cents. Then in August, 1924, the average was 27.31 cents, and in 1926 only 17.79 cents.

The figures do not show the greatest extremes during the period. Between the Fall of 1919 and that of 1927 cotton passed through three long-pull up-and-down cycles, each of which comprised price variations of 200 to 400 per cent. These changes necessarily injected into the production, marketing and manufacture of cotton elements of uncertainty, or variations as to price which exceeded all other factors or change.

The variations were not owing in much part to general conditions made variable beyond the usually normal by post-war readjustment. They owed evidently in most part to factors which portend repetition in future of something like the same cycles of change. The biggest factor is probably the weather, the importance of which has been much augmented by the boll weevil and its spread throughout the Southern cotton belt.

Extreme variations in the volume of production and in consequent prices make only for uncertainty and instability in all the important avenues of cotton.

Why don't all concerned, growers, distributors, manufacturers, get together on a program of inquiry and maybe agreement looking to the lessening of these variations? They certainly could bring into existence machinery via which closer touch could be kept with the facts which affect the cotton price level. Delay in procuring available facts probably have had much to do with causing the extreme fluctuations of recent times.

The Geneva Conference.

The failure of the powers represented at the Geneva Conference to agree on further limitation of naval armament demonstrates that the outlawing of war, or lessening by common agreement the danger of war, still is in most part an Utopian dream. The failure was not owing to any renewed respect or desire for war in any quarter but to inevitable conditions. The British with far flung areas tied into an empire by a king without power, a common flag and a navy need many fast vessels to look after even the peace time duties of a navy. Our need is not one of numerous but of large naval vessels. We wanted to apply the curb on numbers, the British wanted to put it on the sizes of cruisers, there being sound justification for the stand taken in each case.

While the curbing of costly naval armament is desirable as an economy, the real discouragement of war depends more on the limiting of land armament. There is something seemingly in the nature of navies which make more for peace than for war. Warships are means more of defense than offense. They have plenty to do even in peace time. Big armies that have little to do in peace times, armies in which quick and rapid promotions occur only when war is on, armies that can prove their worth only in actual conflict, are often the actual precipitants of needless wars.

Our army is not a threateningly large one; neither is that of the British. But many of the Continental armies still are threats to the peace of the world. Until they are curbed, all attempts to lessen the danger of war by limiting armament will be mere gestures.

We Have the Goods.

Of course much that was said at the recent convention of the International Chamber of Commerce about raising the standard of living throughout the world was mere chatter. But behind it was a good deal that should not be confused with wordy philanthropic sentiments expressed for their sound only. Wise producers now know that better living standards mean increased consumption and larger and more profitable sales.

Any raising of world living standards will help America, in a material sense, more than any other land; for we have the greatest supply of goods, and means for producing still more, that would be called for by the new demand.

Viewing the subject from the crass standpoint of profits alone, it might pay the United States to set aside some ten to five per cent of annual net earnings for stimulating, by purely propaganda or philanthropic method, a desire for more and better things among the masses abroad.

To get the average Chinese coolie to buy an extra

shirt a year might mean more for American prosperity than the persuasion of all Europe to pay in full the war debts owed this country.

Textiles—Ancient and Modern.

BY S. DALE.

The naming of common textiles comprises a romantic history. How interesting a bolt of plaid material becomes when we know the origin of the word. The Gaelic term "peallaid" means sheepskin and this was the material formerly used for the top garments of the Highlanders. Plaid is sometimes called "check" which means, of course, checkered or marked with cross lines or variegated designs and taken probably from the fact that the counters on a checker board are moved in crossed lines and are called checkers.

From the German word "Zwillich" comes "twill" meaning trellis work, suggested from the diagonal ridges running through the material of that name.

There are two versions of the origin of the word "tweed". It is true that this cloth originally was manufactured in the vicinity of the Tweed River, but a more unique explanation of the name lies in the story of a shipment of the goods to James Locke in London. On the invoice it was billed as twill which was the original name but the invoice was blurred, he read the name as "tweed" and tweed it has remained.

Some fabrics take the name of the locality in which they are manufactured. Damask was first woven in Damascus; muslin came from Moosul in Mesopotamia; nankeen is a native of Nankin in China; from the town of Calicut on the Malabar Coast we get calico; the Valley of the Cashmere in India first gave the world the cloth of that name; from the village of Damietta, Egypt, we first received dimity; we are indebted to Spain for the material known as valence, which takes its name from Valencia; cambric was first made at Cambray and tarlatan at Tarare, the latter two towns being situated in France. At one time the town of Worsted, in Norfolk, was chiefly dependent upon the material of that name for its prosperity.

Still other cloths derive their names from the words in various languages which especially describe the material. Such is the case with silk, taken from the Latin sericus meaning soft; and satin from the Italian seta a grade of silk distinguished for its gloss and close texture. Cotton is a derivative of qoton, an Arabic word. The Italian verb broccare means to stitch or to mark with figures, thus we get the name brocade for variegated or figured silks.

When the Moors invaded Spain they brought with them herds of Angora goats the fur or hair of which they used in the making of their garments. From this connection, we get Moor hair or more commonly called in this day mohair.

We must look to Persia for the explanation of the word chintz which means spotted or stained in that tongue and to the same country we are indebted for the naming of taffety or taffeta which is taken from the Persian taftan which means to spin or weave.

The word linum means flax in Latin; thus linen is an Anglicized version. Fine linen bleached upon a lawn instead of the usual drying ground becomes "lawn."

Sometimes the name is not a true designation. The cloth known as moleskin is not truly moleskin, of course; it is a strong cotton fabric with a smooth surface like the skin of the animal after which it is named.

There is a species of llama found in Peru known as an alpaca and the cloth of that name probably has some ancient connection with the district in which the animal thrives.

Jersey was first produced in the town of that name and kersey is simply a corruption of jersey.

From the Japanese we first received our gingham, and we adopted their name for this material too, but changed it from the native ginggang to the somewhat simpler pronunciation.

Grosgrain is a French word meaning coarse grained. A French king once adopted a heavy corded material for his garments which became known as the King's cord or Cord du Roy and in our day and age is available for people other than royalty under the name of corduroy.

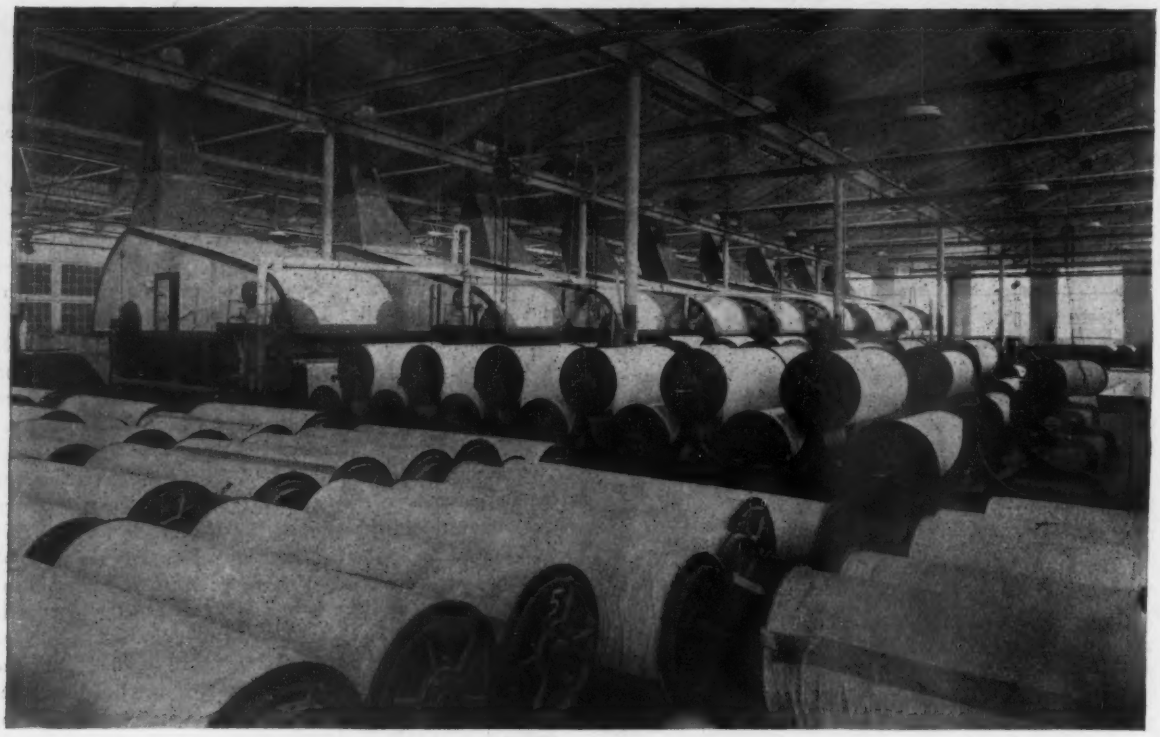
Tapestry is derived through the French tapisserie from the Latin tapes, a carpet. In 1728 a marvelous tapestry was discovered in the town of Bayeaux in Normandy. This is supposed to be the lost tapestry which was the work of Matilda, queen of Willian the Conqueror, and her maidens. This tapestry has since been designated as the Bayeaux Tapestry. In 1470 there flourished in Paris the famous Gobelin Brothers who were great dyers. In 1662 Louis the 14th took over the old and noted establishment of the brothers and devoted its output to the manufacture of fine tapestries for the adornment of his palaces. The tapestries made in this era are therefore known as the Gobelin tapestries, and are scattered throughout the world in art galleries and private collections. The invention and manufacture of tapestry was originally supposed to have been in the town of Arras in the Netherlands.

The word embroidery is a derivative of embordering which means to decorate any material with a border.

In 1561, Barbara Uttmann of St. Annaberg invented the method of making lace by means of twisted threads wound on a series of pins on a cushion. The economy of this system was soon evident and this "pillowlace" gradually superseded the old method of manufacture which was with the fine points of needles. Lace made on the needles was called "point lace" and was extremely costly. Laces have usually derived their names from the locality in which they originated. Thus the towns of Lisle, Chantilly, Brussels and Valenciennes have given their names to lace made in their neighborhoods. At the time that Louis the 14th established the tapestry mills, he also set up a great lace factory known as the French Royal Lace Factories and he put M. Colbert in charge as superintendent. Laces from this factory came to be known as colbertine lace. Tulle, a sort of net lace, is named after the town in wheih it was first made. From the Latin word laques, we receive "lace", meaning a noose or snare.

The History of the Incandescent Lamp.

The development of the incandescent lamp, from its invention to the present day, has all taken place during the working lives of some men still in the business. "The History of the Incandescent Lamp" is the title of a book by John W. Howell and Henry Schroeder, which has just been published by The Maqua Company, Schenectady, N. Y. It gives the history of the lamp and portrays the changes and developments that have occurred to bring it to its present state of perfection and efficiency.



Slasher Room at Lanett.

This view shows 9 of the 13 slashers operated at the Lanett Mill of the West Point Manufacturing Company, Lanett, Ala. These machines are fully equipped with regulating and control apparatus for temperature, having Powers regulators on the cylinders and Foxboro controls on the size boxes and kettles. The slashers are located in a roomy, airy weaving shed with saw-tooth roof construction, adjacent to the weave room at the south end of the mill. As will be noted from the photograph the slashers and storage space for beams are fully equipped with overhead trolley service, having Yale half-ton hoists on the back and Louden hoists and track on the front.

What the Southern Mills are Doing.

A two-story addition to the Sadie Cotton Mills, to measure 104x128 feet, is being erected, and the capacity of the plant, which manufactures combed yarns, will be doubled when the addition is put into operation. The present equipment includes about 8,000 spindles. L. A. Kiser is president, and D. C. Mauney is secretary-treasurer.

Howard Silk Throwing Company, of Philadelphia, will remove its plant to Mebane, N. C., where a building has been secured and is being remodeled to accommodate the equipment. The company deals in the converting and dyeing of rayon and silk throwing, and will have an initial output of about 10,000 pounds weekly. J. E. Crayton, formerly of Charlotte, N. C., will be manager. Fred H. Sharp is president.

Southern Webbing Co., Greensboro, N. C., which for three years since its organization has occupied leased quarters, will erect its own plant immediately. This will be the start of an expansion program which will in two years treble the present capacity of 250,000 yards per month of elastic webbing for overall and garter manufacturers.

New opening and cleaning equipment has been installed at the Sanford Cotton Mills, Sanford, N. C., where other improvement work is also underway.

Considerable improvement work is being carried out at the Statesville Cotton Mills, Statesville, N. C. Twenty new cards are being installed, as well as new cleaning machinery, and a 75,000-gallon water reservoir is being erected.

Contract for a one-story addition, 40x175 feet, has been awarded by the Kerr Finishing & Bleaching Co., Concord, N. C. J. E. Sirrine & Company are the engineers.

Hickory Spinning Company, Hickory, N. C., plans the erection of a large manufacturing addition, according to report.

Combers and additional equipment for producing fine combed yarns to replace the former carded yarn production have been installed by the Union Mills, Maiden, N. C.

North State Cotton Mills, Taylorsville, N. C., will, it is understood, increase the capacity of the plant by the addition of 1,000 spindles before the end of the year.

Pinoca Mills, Pinoca, near Charlotte, N. C., have begun operations, weaving brocades and other rayon fabrics. The initial equipment includes 60 looms; the entire production will include a wide range of drapery fabrics. The plant is owned by the National Fabric Company of New York. F. A. Hansusek is local manager.

Vis-Tex Mills, of Philadelphia, Pa., have secured a building in Burlington, N. C., and will equip a plant for winding and copping rayon. E. E. Eteifler, of Philadelphia, will be in charge.

An addition to double the capacity is being erected at the Yadkin Cotton Mills, Roaring River, N. C.

Rhyne-Anderson Cotton Mills, Troy, N. C., was sold at public auction to E. O. Anderson and J. L. Staten, of Charlotte.

Cliffside Mills, Cliffside, N. C., will soon complete a new four-story concrete warehouse, 66x110 feet.

MATHIESON Industrial Chemicals

An Ancient Emblem with a Modern Meaning

THE "Fascisti", the present Italian governing party, takes its name from that famous bundle of birch rods, which since ancient times has denoted strength through unity.

The fasces might well be the symbol or trade mark of the Mathieson Alkali Works. If one rod bore the label "manufacturing facilities", another "distributing organization", another "traffic service", and if others bore the names of the various departments of this organization, the emblem would convey some idea of the purpose—the keynote—of the Mathieson policy.

In short, the entire Mathieson organization is bound into one harmonious whole, by a single, unified objective and purpose. That objective is loyal and faithful service to Mathieson customers. That purpose requires the perfect coordination of all branches of activity, and that inter-dependence of functions which insures all-round efficiency.

The unity of the Mathieson organization also suggests that customers' needs are well understood and that, therefore, customers' orders are sure to be intelligently executed.

By specifying EAGLE-THISTLE when ordering chemicals, you can be sure of receiving all the benefits that accrue to Mathieson customers as a natural result of a unified and complete manufacturing and distributing organization.

CAUSTIC SODA
LIQUID CHLORINE
BICARBONATE OF SODA
MODIFIED VIRGINIA SODA
SODA ASH
BLEACHING POWDER
ANHYDROUS AMMONIA
AQUA AMMONIA

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PHILADELPHIA CHICAGO PROVIDENCE CHARLOTTE CINCINNATI

Works: Niagara Falls, N. Y.—Saltville, Va.

See our exhibit, Booth No. 89 Chemical Industries Exposition

Deal Direct with the Manufacturer

It is announced that the Pickens Mill, Pickens, S. C., will erect 75 new houses in the village to provide for additional operatives to run a night shift. The homes will be equipped with electric lights, water, baths, etc.

Col. Leroy Springs, of Lancaster, S. C., president of the Fort Mill Mfg. Company, Fort Mill, S. C., announces plans which include the erection of a bleachery at Fort Mill, as well as the development of considerable water power. Lockwood, Greene & Company are the engineers. George Fish, vice-president of the Fort Mill company, will supervise the work. Elliott White Springs, son of Colonel Springs, has been made active treasurer of the properties at Fort Mill.

Inman Mills, Inman, S. C., will erect a four-story addition to their present plant, to be 155x78 feet and to be used for increasing capacity. The mill now has 40,000 spindles. J. E. Sirrine & Company are the engineers in charge.

Contract for the erection of the mill for S. Slater & Sons, at Marietta, S. C., has been awarded by J. E. Sirrine & Co., engineers, to the Fiske-Carter Construction Company. The contract calls for the construction of a main mill, a weave shed, warehouse with opener room attached, and boiler room and reservoir. A village will also be erected. The initial plant will contain 10,000 spindles and complementary looms.

Burns Lace Manufacturing Company, of Middletown, Conn., will remove its plant to Clinton, S. C. A new building, to be two stories, 75x215 feet, of brick construction, will be erected. In addition to the manufacture of lace, it is understood the company will have facilities at Clinton for dyeing rayon and cotton piece goods.

Appleton Mfg. Company, Anderson, S. C., will, it is understood, erect a large addition to which some 30,000 spindles and complementary looms will be removed from the Lowell plant of the company.

New opening and cleaning equipment has been installed at the Graniteville Mfg. Co., Graniteville, S. C., and 300 new Draper looms have replaced former equipment.

A third plant will be erected by the Dupont Rayon Company, at Old Hickory, Tenn., it is announced, and an enlargement of 20 per cent will be made to the second plant which is now in operation. This expansion will, it is reported, increase the monthly production to more than 1,250,000 pounds of rayon.

The addition which the Dixie Mercerizing Company is making to its finishing plant will be two-story, 69x159 feet, of reinforced concrete construction, it is announced. Robert & Company are the engineers.

American Bemberg Corp., Johnson City, Tenn., will erect a tremendous addition to their present plant. Lockwood, Greene & Company are the engineers.

American Glanzstoff Corporation will begin construction of its first rayon manufacturing plant at Johnson City, Tenn., in September, it is announced. Lockwood, Greene & Company are the engineers.

An extensive replacement and expansion program has begun at the Columbia Cotton Mills, Columbia, Tenn. The mill is being electrified and other improvements made.

Dale Cotton Mills, Ozark, Ala., is changing its production from yarns to cloth, by the addition of 140 looms.

Avondale Mills Company has purchased a site adjoining its present plants at Sylaucauga, Ala., and it is understood this will be used for plant expansion there.

A. B. Patton and W. G. Mitchell, Tuskegee, Ala., are reported as interested in erecting a 10,000-spindle cotton mill at that place.

San Marcos Cotton Mills, San Marcos, Texas, will, it is understood, be in operation by the first of next year. The new officers are A. L. Davis, president; A. L. Blair and L. G. Johnson, vice-presidents; and P. M. Keller, manager.

Tallapoosa Mills, Tallapoosa, Ga., are contemplating the erection of an addition, according to a rumor.

New drying equipment and wide seat cover finishing machinery has been installed at the Swift Manufacturing Co., Columbus, Ga., where the finishing and cloth rooms have been completely revamped.

A new unit of drying and finishing machinery has been installed at the Thomaston Bleachery, Thomaston, Ga.

Imperial Cotton Mills, Eatonton, Ga., has closed a contract with the Georgia Power Company for the electrification of the mill.

Swift Spinning Mills, Columbus, Ga., will erect a large three-story addition. Robert & Company are the engineers.

New England Mill Situation.

On the whole the New England mill situation and outlook continue favorable in contrast with conditions at this time in recent years. While there is a great plenty of poor spots there are many bright areas even in centers that are commonly supposed to be decadent.

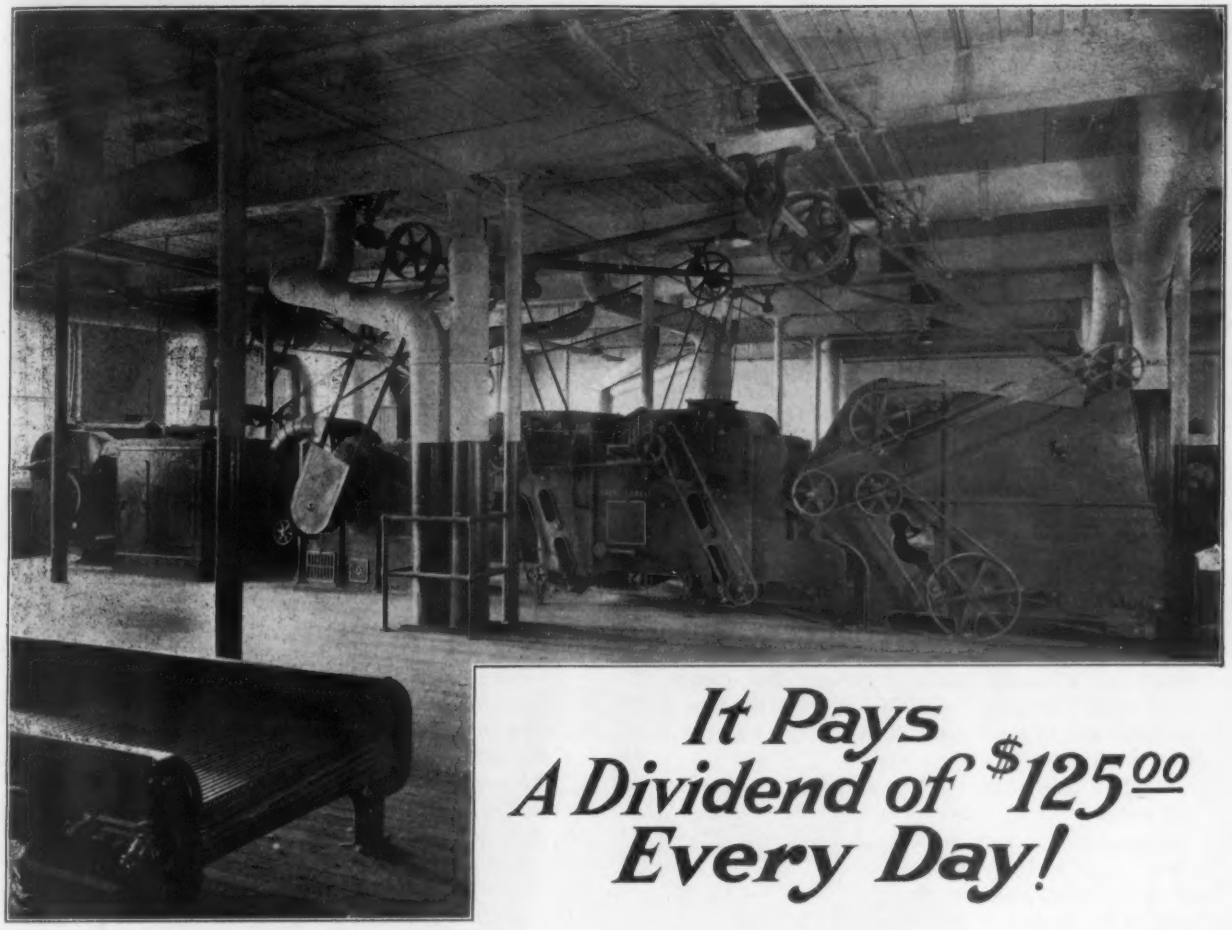
In Fall River, for example, the two large print works, the American and Algonquin are running substantially in full with orders ahead that will keep them employed for some time. New prices were named on percales and other lines by these two concerns on a basis of ½ cent a yard higher than the last, and substantially higher than any price since late last year.

The American has gone into rayon printing in a large way and has rather astonished the trade by announcing its unwillingness to include in its lines any of the sub-standard rayon constructions that have been used so freely in the underwear and converting trades. It is the contention of the agents that consumers have reason to revolt against the lack of utility in many of the low count rayon fabrics combined with cotton. They break away at the seams of a garment, and are so fragile a finger may be forced through them.

By using nothing but a high construction cloth, whatever treatment may be given to it, the printers say they will be able to preserve the integrity of their trademarks and will eventually build up a good will that will overcome any price competition. The experiment is being watched with a great deal of attention.

Additional interest attaches to it from the fact that the new cloths are beautifully colored and designed and have been highly commended by many of the large wholesale buyers who say they are ready to back any effort to improve the general quality of popular priced rayons. The company has also brought out completely new lines of cretonnes, and its lines of percales for early spring have been designed in new colors and figures.

In Fall River, also, the fine goods mills are running in full, and they now comprise a substantial part of the in-



It Pays A Dividend of $125.00 Every Day!

A Well Known Southern Mill Reports to Us That - - -

SINCE installing SACO-LOWELL'S line of Opening Equipment they have been able to lower their grade cotton from 1 to 1½ grades; making an average saving of at least 1c per pound.

As they open 12,500 pounds per ten hours, this saving amounts to ONE HUNDRED AND TWENTY-FIVE DOLLARS A DAY.

The initial investment was slightly over five thousand dollars, and consisted of the equipment illustrated above, Bale Breaker, Tandem Feeders, Lattice Opener and Cleaner, Vertical Opener, and Horizontal Cleaner.

This equipment PAID FOR ITSELF IN FORTY-TWO DAYS; and from then on netted the mill a dividend of $125.00 EVERY DAY.

LET US MAKE A STUDY OF YOUR OPENING AND CLEANING REQUIREMENTS, IN ORDER TO SHOW YOU WHAT WE CAN SAVE YOUR MILL.

SACO-LOWELL

Largest Manufacturers of — *It pays to Install Modern Machinery* — *Textile Machinery in America*

installed spindleage. The Osborn mills are still in the hands of a receiver but will be reorganized. The Chace mills have been shut down. The Seaconnet mills are being started up after expenditures of nearly a million dollars have been made on new equipment by a New York converter who bought the plant at a tax sale.

The American Linen, one Stafford, Conanicut, and Ancona mills are idle. The last of the machinery has been taken from the old Globe Yarn mill property and transferred South to be used in tire yarn production. Reports of a transference of the Border City Mills machinery South do not appear to be well verified. In the last statement of quarterly dividends paid by Fall River corporations, 25 passed their dividends and 12 paid.

In Lowell, the Massachusetts plants bought by the Pepperell Mfg. Co., are being operated in full on novelties, crib blankets, etc. The Hamilton Co. has paid 87½ cents on a dollar to creditors to date. Reports that more machinery will be transferred from the Appleton mills to the southern properties of the company have been denied but it is believed that changes in that direction are probable. It is also denied that the Lowell branch of the Saco-Pettee shops will be moved from Lowell.

In Lawrence the Everett mills are closed and it is believed they will never resume operations. The question of whether the York Mfg. Co., of Maine, under the same management, will be liquidated, will be answered shortly at a stockholder's meeting.

In New Hampshire, the Nashua Mfg. Co. is running in full and is profitably employed on blankets. The Amoskeag Company is very busy in its flannel departments, and on many specialty fabrics. Inactivity still prevails in many of the gingham departments but it is stated that 65 per cent of the equipment is employed. The worsted department continues active and profitable. The company recently showed its new spring lines to the cutting trades and they were wonderfully styled in all cotton and in rayon fancies.

The question of what will be done with the Lyman plant in central Massachusetts has not been answered. This is the case of a mill whose directors recommend its liquidation, because it can be done at a profit to the stockholders, netting them $165 a share. It has a handsome surplus. Objections have been made by stockholders and investigations are underway preparatory to making reports to future meetings. More than half the plant is equipped with fine yarn spindles, combers, etc.

The Lancaster Mills of Lancaster, Mass., are being equipped constantly with new machinery. Operatives were given a five weeks vacation preparatory to starting on spring lines which were shown in the markets a few days ago. These new lines are remarkably styled in colors and many rayon and cotton fabrics are in the new offerings. The Boston Mfg. Co., at Waltham, Mass., is running steadily on very fine yarn fancies, largely of rayon content.

Bedspread mills in New England, the Monument, of Housatonic, Mass., the Stevens, of Fall River, the Bates, of Lewiston, Me., and a small mill in New Hampshire have changed over the product almost wholly to cotton and rayon fabrics. Many of them are of the most costly character, some running up to a price basis of $12 each. Closely woven cotton foundations with jacquard woven designs feature most of the lines made. The all cotton quilt appears to have passed largely out of the trade for the time being.

In Rhode Island the mills are making very fair progress. Fruit of the Loom goods are now being offered in printed form, a couple of multi-color machines having been installed in the old Cranston print works owned by B. B. & R. Knight, Inc. The standard bleached cottons made by the company are still being offered, including wide sheetings. The Social mill of the Manville Company at Woonsocket, has been closed following the labor troubles there and will probably not be reopened. The Wayposset mill at Pawtucket, recently purchased by the William Iselin interests is being operated in full on fancy production of silk, rayon, and cotton combinations. The mills of the Lonsdale Company are running in full.

In Connecticut, the cotton mills are active and recent financial reports show that concerns like the Baltic, Lawton, Ponemah, and others, are making money. There are a number of smaller concerns in the state operating almost wholly on rayon combinations that formerly ran on all cotton goods.

In Maine the cotton mill operations are rather steadier than for some time, the large Pepperell plants being run in full on many varied lines of goods. The Bates is operating few of its gingham looms on regular products but its bedspread department is very well employed. The Continental, Androscoggin, Lockwood, Edwards, and Hill plants are running steadily.

New Bedford is running well up to capacity. It is not quite as active during the summer months as it will be later on, but as a rule the mills there appear to have passed through their most troublesome days and are showing much better earnings. They have gone very largely into fine rayon products for dress wear, upholstery purposes, and for general converting. They are using silk and rayon in large quantities and on many goods of silk and rayon combination they are producing cheaper and better than many of the all silk plants.

Owing to the great price uplift in staple cotton, following the damage done by the Mississippi flood, it appears now as if the mills will be hard put to it to secure supplies at reasonable figures. The rise in Egyptian cotton prices has been of the most spectacular character owing to the speculative demands there from English and Russian mills, to say nothing of the moderate pressure to secure any available supplies for this country.

The situation in the fine combed yarn mills is better, generally speaking, than it has been in several years. Some mills are running in full that have been more than half idle for months at a time. Prices have advanced very sharply and continue strong, due to the staple cotton conditions and the constantly growing need of tire fabric concerns for strong fine yarns for their purposes.

Finishing plants are passing through their normally slack period and are not operating on the average much above 65 per cent capacity. There are some individual plants running in full on rayon printing or dyeing. The large eastern finishing plants are expending a great deal of money in research to determine the best methods of handling various sorts of rayons and some of the results being obtained are truly amazing.

Machinery plants are running irregularly. The loom works are doing rather better than spinning machinery sections. The large use of new forms of preparatory machinery in the handling of short staple cotton is keeping

H & B AMERICAN MACHINE CO.

Pawtucket, R. I.

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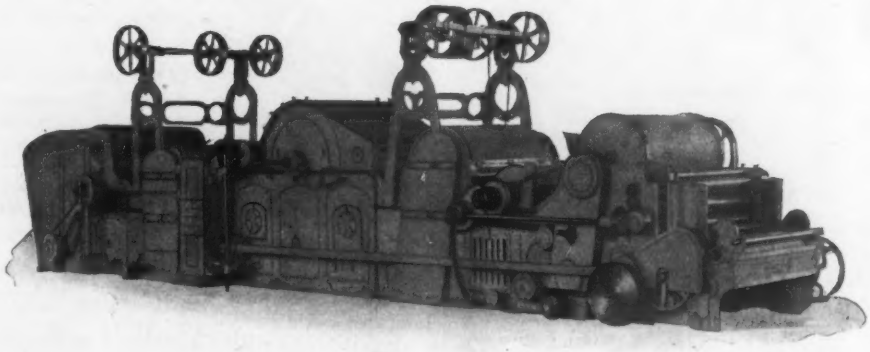
Our New Consolidated
Automatic Feeder, Buckley Opener and Breaker Lapper



This machine combines greater cleaning power with more gentle treatment of the cotton. The Continuous Gridded surface from Cylinder to Cages and Full Width Feed gives Perfect Regulation of Weight, Improved Quality, Increased Production and Reduced Cost of Operation.

A Modern Consolidated Picker Unit
for All Classes of Cotton

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some divisions well occupied, especially on orders for southern mills. It is probably not realized to what extent the use of sledded cotton and the use of short staples has gone in recent years, not only for cloth purposes but for many others.

A noticeable feature in the New England situation is the lack of keen interest in cotton crop developments, comparable with that seen in past years of an overturn in speculative markets. It is generally believed that higher cotton prices will again set the industry back somewhat, because of a lack of the very large distribution seen in the past year of low priced staple. So many of the mills have gone into fine dress goods or other products in which cotton is not such a preponderating element of cost as it used to be when other products predominated, that most of the attention is focused on the premiums that selected staples may command.

Contrary to many published reports to the opposite, many cotton manufacturers of long experience are of the opinion that the crop will be very short, unless it again turns out as it did last year, that abnormally good weather conditions prevail in the late weeks of the crop growing and harvesting period.

As a matter of fact, many New England manufacturers do not object to reasonably priced cotton, as they believe through it there will come a better selection of seed and staple as the years go on.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, August 13th, 1927.

The continuance of generally unfavorable wet weather inland, increasing complaints of damage by insects, a record breaking worlds' consumption of American cotton last season, and much smaller crop indications for this year, are reflected in a further advance in values of about 260 points, or $13 per bale compared with one month ago. In fact prices were about $22 per bale higher than they were at this time last month on the day following the issuance of the first government crop forecast of the season, but much of the rise in the market was subsequently lost by extensive liquidation during the past week.

Rains, more or less general, continued during the last half of July, spinners takings during the past season, according to Secretary Hester of the New Orleans Cotton Exchange, were the largest on record, as was the world's consumption of American cotton. Such was the situation at the close of July when the trade was anticipating the government to forecast a yield of at least 14,500,000 bales.

But the government's forecast was for a production of only 13,492,000 bales, and coming like a bolt from the blue, sent prices sky high, distant deliveries climbing to above the 20½ cents price level, which induced extensive liquidation, resulting in an important reaction.

Returns to the government were compiled as of August 1st, since which date rather general showery weather has prevailed almost daily except in portions of Texas. Commenting on the crop outlook, as of August 1st, the government stated that the outstanding feature of the situation at that time was the boll weevil menace, and that further damage was likely if the rains continued during August and September. Since the rains have continued during the first half of August it is possible that the crop has falied to improve, perhaps deteriorated further.

The recent extensive liquidation has undoubtedly placed the market in a healthier condition technically, and as unfavorable weather has been the rule generally except in Texas, and as insects, army worms and boll weevils have been doing damage also in that important State, if only locally, the late downward reaction seems to have gone far enough, making it probable for the market to experience another sharp advance in the near future, especially if the unfavorable wet weather continues, particularly in Oklahoma, in the Mississippi Valley States and in the South Atlantic region.

Bales, Season—	1926-27	1925-26
Takings by American mills.....	8,220,000	7,299,000
Exports from the United States...	11,244,000	8,252,000
Takings by mills of the world.....	17,923,000	15,306,000
Consumed in the U. S., Am. cotton.	7,830,000	7,035,000
World's consumption, Am. cotton..	17,428,000	15,112,000
World's carry-over of Am. cotton..	7,238,000	5,639,000

The large consumption by the world of American cotton last season, and the flourishing condition of the cotton textile situation in nearly all countries of the world, denotes the probable need of at least a moderate American crop this year, whereas Washington's forecast, as of August 1st, was for a yield of only small proportions, with the possibility of being reduced further by unfavorable weather and insect damage.

SEASON'S INDICATED SUPPLY OF AMERICAN COTTON.

Bales—	This season	Last season
World's carry-over August 1st..	7,238,000	5,639,000
Actual growth, inc. linters, etc...	14,692,000	19,100,000
Indicated season's supply	21,930,000	24,739,000
World's consumption, if	17,428,000	17,428,000
		7,311,000
To balance, deduct		73,000
Indicated world's carry over July 31	4,502,000	7,238,000

In other words, if this year's crop is not larger than now indicated, and it may be smaller, and on the basis of last season's consumption, the world's carry-over of American cotton at the close of next July, which includes mill stocks, would be about 2,736,000 bales smaller than it was at the close of last July.

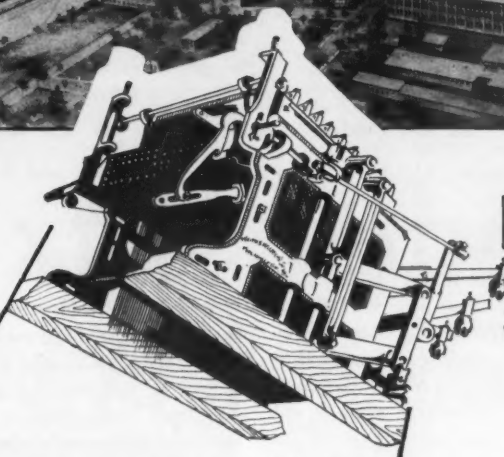
Aside of the weevil situation this year, other insects are at work, and there is much late cotton in west Texas and in the central valleys, which could be seriously injured by an early killing frost.

Earle Opens New York Office.

The Earle Gear & Machine Co., with main office and plant at 4707 Stenton Ave., Philadelphia, announces the opening of a New York district office, at 95 Liberty St., New York City, with C. N. Walsh and George E. Barrett in charge. The company also maintains a Boston office in charge of W. H. Allen at 110 State St., Boston, Mass.

Booklet on Soda Cements.

The latest bulletin of the Philadelphia Quartz Company, 121 South Third St., Philadelphia, Pa., is entitled "Silicate of Soda Cements," being a comprehensive treatment on the use of silicates of soda in various kinds of cements.



HALTON JACQUARDS

The texture, beauty of design and the elegance of the pattern and weave of Cheney Silks mean much to the silk trade throughout the United States.

The oldest and incidentally one of the largest silk manufacturing plants in America, Cheney Brothers, Manufacturers, have used ***Halton Jacquard Machines*** in the manufacture of many of their various products for over 30 years.

Halton's Jacquards Stand the Test of Time and Service.

We do harness building of every description.

We are prepared to furnish at short notice comber-boards, lingoes, mails, etc., Ingrain and Brussel parts.

We do replacing and repairing of Jacquard machines of other makes as well as our own.

Immediate and expert attention our guarantee.

THOMAS HALTON'S SONS

Mascher St. below Oxford

Philadelphia

H. A. Forbes, *Selling Agent*
P. O. Box 1663, Paterson, N. J.
Telephone Lambert 8592-W

"USE A HALTON JACQUARD AND YOU USE THE BEST"

National Association Year Book.

The 1927 Year Book of the National Association of Cotton Manufacturers, was issued for distribution last month, and this edition forms the most complete and useful manual as yet published by the Association. It presents in concise and condensed form a host of figures and statistics, and has been brought up to date by the revision of former tables and the addition of other matter. It is divided into three major sections, the first listing the association membership, officers, etc. The Statistical Section, forming the second part, includes new tables, among them being one giving the production, shipment, sales, stocks and orders on certain standard cloths by quarters for 1926. This is the first time data of this sort has been available. In the Technical Section is given the construction of many of these fabrics.

The statistics also include figures on the production, exports, imports and consumption of rayon yarn in 1926. Other new material added includes the expansion of the table giving the range of staple of various cottons; midseason stocks of all cotton in the world; number of active ring and mule spindles in the country; quantity of several kinds of cotton consumed and of stocks held, etc.

The Technical Section has been radically revised. Chemical methods of identifying the different rayons is one of the new features. The new material also includes a list of all Federal Specification Board Specifications for cotton materials; a list of the widths of standard fabrics; range of card settings; range of production for roving and spinning frames; revised table for numbering roving, etc. While primarily for Association members, copies of the book may be secured by other interested parties. The address of the association is 80 Federal St., Boston, Mass.

Useful Information in Southern Textile Book.

The latest book of proceedings of the Southern Textile Association, which has just been published, comprises a volume of extremely useful information to the mill man. According to custom, the proceedings of the Asheville meeting last summer are reprinted. In addition to this information, the book contains a report of each of the departmental discussion meetings held since the issuance of the last edition—these include the carding discussion, the spinning discussion, the Eastern North Carolina discussion, the master mechanics' discussion, and a reprint of COTTON's story of the Texas Textile Association meeting in Waco last May. Each of these reports contains much practical information developing from the mill discussions at each meeting. Appended to the spinning division report is the compilation made by Chairman Harris giving the results of a questionnaire, representing some 68 different yarn numbers, as to different practices in the spinning room.

A section of the book is given over to The Arkwrights, Inc., the association's research organization. In this is given a list of the members, as well as summaries of nine of the tests—from Test Five through Test Thirteen—on which medals have been awarded, the first four tests appearing in the previous edition of the book. These tests were referred to on page 892 of the July issue of COTTON. Each test reported contains practical mill information on the subject under consideration.

Copies of the book have been mailed to Association members. There is a limited supply of copies available for non-members, at $2.00 per copy. Those interested should address J. M. Gregg, secretary, 519 Johnston Building, Charlotte, N. C.

Acetate Silk and Its Dyes.

A complete and thorough discussion of the subject of "Acetate Silk and Its Dyes," is given in a book of that title, by Charles E. Mullin, M.Sc., consulting chemist, which has just been published by D. Van Nostrand Company, 8 Warren Street, New York City. The price is $6.00 per copy.

In this volume, Mr. Mullin has presented in a comprehensive manner the history of the remarkable development of acetate silk dyeing, and has described with detail the processes which are now in use for this purpose. The book should be found valuable as a reference book and as a textbook for those who are interested in the dyeing of cellulose acetate silk. Copies may be had through COTTON's book department or direct from the publishers at the price named.

Black and White—By Houghton.

E. F. Houghton & Co., Philadelphia, Pa., whose publication, "The Houghton Line", is one of the most widely known house organs, has begun an additional magazine, entitled "Black and White". The purpose, as stated in the foreword by President Carpenter, is "to circulate more and better technical information pertaining to the industries upon those topics with which the Houghton organization in general and the Houghton research staff in particular are much more familiar than anyone else." It is a technical magazine, couched in non-technical language. The first issue is dated June 1927. It is proposed to cover various industries in the successive issues. The first number is devoted to textiles, and such questions a warp sizing, oiling rayon, grading raw silk, yarn testing, waste, etc., are covered in an entirely practical manner.

Roof Insulation.

An interesting four-page circular on cork roof insulation has just been published by L. Mundet & Son, Inc., Hillside, N. J. It includes specifications for cork on wood deck construction, over concrete construction, and over steel roof decks. It declares that cork insulation has advantages for roofing insulation, advancing, interestingly, the points that it keeps heat in and out, eliminates ceiling sweat, fits, lasts and is immune to moisture. Copies may be secured upon request.

Rodney Hunt Water Controlling Apparatus.

Rodney Hunt Machine Company, Orange, Mass., have issued a catalog on their water controlling apparatus—stands, hoists, gates, etc., for power plants, reservoirs, etc. It is the first new section of the general water power catalog, which has been increased from the old size of 6x9 inches to a convenient size of 8½x11, being loose leaf. The engineering section, giving technical information including charts, formulae and data, is especially complete. The booklet illustrates and describes the products of this company, who have been in the field for over fifty years.

Representing Boyce Weaver's Knotters.

Mills Devices Company, Gastonia, N. C., manufacturers of Boyce weaver's knotters, have appointed M. B. Garrison as representative in Georgia and Alabama.

TEXACO—for Dependable and Economical Lubrication—TEXACO

[*As Power Savers*]

TEXACO Spindle Oils

These Textile Lubricants *are highly endorsed*

You may consider price—and you will; you will consider body (and you should); and of course you must consider purity—for it means the elimination of oil stains.

But the greatest economy, from the standpoint of parts, replacements and ultimate cost of the finished textile depends on the use of an oil which permits the most efficient operation of *the greatest number of spindles per horse power.*

Such Oils Are TEXACO SPINDLE OILS.

Our lubricating engineers have in many, many cases effected unbelievably notable reductions in power consumption by the application of TEXACO SPINDLE OILS to spinning frames in textile mills throughout the country.

It is for this reason undoubtedly, more than for any other reason, that TEXACO SPINDLE OILS are so highly endorsed by lubrication Engineers in the textile industry.

We are ready to demonstrate how TEXACO SPINDLE OILS will improve machinery operation, increase production, and decrease power and oil consumption throughout your plant—regardless of the type, age or condition of the equipment under your supervision.

Start improving spindle operation and decreasing power consumption by calling on us today.

Other TEXACO Textile Mill Specialties Are:

TEXACO LOOM OILS
TEXACO TOP ROLL LUBRICANTS
TEXACO MACHINE OILS
TEXACO ELECTRIC MOTOR LUBRICANTS
TEXACO TURBINE OILS
TEXACO ENGINE OILS
TEXACO GEAR LUBRICANTS
TEXACO GREASES

THE TEXAS COMPANY

Texaco Petroleum Products

Dept. C9—17 Battery Place, New York City

OFFICES IN PRINCIPAL CITIES

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

C. E. DAVIS is now superintendent of the Thomas Henry & Sons mill at Nashville, Tenn., succeeding C. M. James, who is with the Cherokee Spinning Company, Knoxville, Tenn.

T. D. SHELTON has become superintendent of the Imperial Cotton Mills, Eatonton, Ga., in the position formerly held by S. I. Batchelor. J. I. Alford is night superintendent.

THOMAS MOORE, of West Point, Ga., will, it is understood, be agent of the plant of the West Boylston Mfg. Company, at Chisholm, near Montgomery, Ala. Russell B. Newton, overseer of weaving at the Columbus (Ga.) plant of the Bibb Manufacturing Company, has been selected as superintendent of the new West Boylston plant.

W. R. BARNETTE has become overseer of carding at the Borden Mills, Inc., Kingsport, Tenn.

H. C. HARDEE, formerly general superintendent of the Houston Cotton & Twine Mills, Houston, Texas, has become night superintendent of the El Paso Cotton Mills Co., El Paso, Texas.

JOHN P. CARDLE, who has been superintendent of the Shelbyville Mills, Inc., Shelbyville, Tenn., has returned to England, where his address will be 82 Huddersfield Road, Newhey, Lancashire.

CORNELIUS CASTELINE, for 23 years superintendent of the Jacques Wolf & Company, Passaic, N. J., has been elected vice-president and superintendent of Fernald-Jenkins, Inc., manufacturing chemists, recently organized at Phillipsdale, R. I., and has a financial interest in the organization.

SAMUEL L. MCCRACKEN is now general superintendent of the Hart and Fountain Cotton Mills, Tarboro, N. C.

J. W. GILLEY, formerly overseer of weaving at the Edna Cotton Mills, Reidsville, N. C., now has a similar position at the Fountain Cotton Mills, Tarboro, N. C.

W. D. THORNBERG, formerly carding overseer at the Edna Cotton Mills, Reidsville, N. C., is carding overseer at the Fountain Mills, Tarboro, N. C.

J. D. WATKINS, who held the position of overseer of spinning at the Micolas Cotton Mills, Opp, Ala., now is connected with the Fountain Mills, Tarboro, N. C., in a similar capacity.

J. F. WHITE has changed from master mechanic of the Hart Mills, Tarboro, to the same position at the Fountain Mills, of the same place.

WALTER THOMAS SLAUGHTER, southern represenative of the Wickwire Spencer Steel Company, and Miss Mavis McRee, daughter of Mr. and Mrs. J. M. McRee, were married on August 1st in Jacksonville, Florida. Mr. and Mrs. Slaughter will reside at 712 Selwyn Avenue, Charlotte, N. C.

J. G. GARRETT is superintendent of the full-fashioned mill of Cooper, Wells & Co., at Albany, Ala.

J. B. BELL has become overseer of weaving at the Ninety-Six Cotton Mills, Ninety-Six, S. C., succeeding P. P. Curry, resigned. Mr. Bell was formerly overseer of weaving and manufacturing superintendent at the Pelzer Mill No. 4, Pelzer, S. C.

H. S. FOWLER has become overseer of carding at the Henrietta Mills, Henrietta, N. C. He formerly held a similar position at the Arkwright Mills, Spartanburg, S. C.

J. B. DUVAL has resigned as manager of the Brookford Mills, Brookford, N. C., which position he has held for seven years.

R. L. SMITH has been promoted from night superintendent to general superintendent of the Houston Cotton & Twine Mills, Houston, Texas, succeeding H. C. Hardee.

GEORGE M. WRIGHT has resigned as president of the Watts Mills, Laurens, S. C., to become president of the Republic Cotton Mills, Great Falls, S. C. R. E. Henry, of the Dunean Mills, Greenville, S. C., will succeed Mr. Wright at Watts Mills, it is understood.

E. S. HOBBS has been promoted to day overseer of carding at the Houston Cotton & Twine Mills, Houston, Texas. Lloyd Beacham has been made day overseer of spinning.

J. O. EPPS recently became general overseer of carding at the Rhodhiss Mills, Rhodhiss, N. C. He formerly was night superintendent at the Carolina Textile Corporation, Dillon, S. C.

C. B. BUCHANAN has become superintendent of the Cotton Mill Products Company, Natchez, Miss., succeeding E. S. Tramwell.

W. F. SMITH has become general overseer of spinning at the Loray Mills, Manville-Jenckes Co., Gastonia, N. C.

JOSEPH LEAKE, superintendent of the Weetamoe Mills, Fall River, Mass., has become superintendent of the Judson Mills No. 3, formerly Art Cloth Mills, Lowell, N. C.

ISAAC G. MOORE has resigned as superintendent of the South Texas Cotton Mills, Brenham, Texas. T. A. Adams, manager, will in the future act as superintendent, also, with J. V. Hunt, formerly overseer of weaving, Brazos Valley Cotton Mills, West, Texas, as assistant superintendent.

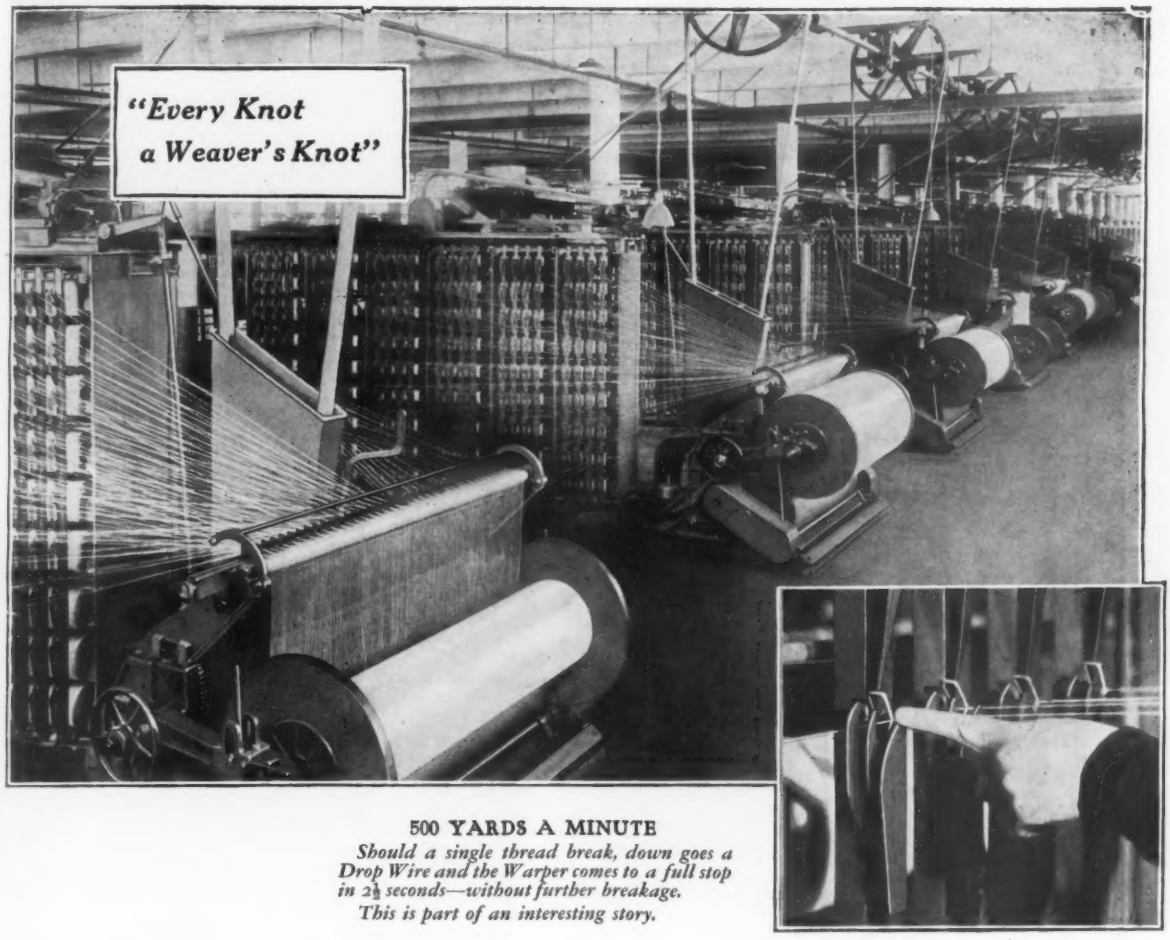
M. H. MCLENDON has become overseer of carding at the Winnsboro Mills, Winnsboro, S. C. He formerly held a similar place at the Manville-Jenckes Company plant at High Shoals, N. C.

Obituary.

BRAXTON BRAGG COMER, president of the Avondale Mills, Birmingham, Ala., formerly governor of Alabama, and one of the South's distinguished figures, died at his home in Birmingham, on Monday, August 15th, at the age of 79 years.

HIRAM D. WHEAT, 68, president of the Irene Mills at Gaffney, S. C., died on July 19th of angina pectoris, after one day's illness. His son, Harry C. Wheat, has succeeded him as president of the Irene Mills.

J. B. MORGAN, 71, founder and president of the Morgan & Hamilton Co., Nashville, Tenn., operators of the Warioto Cotton Mills there, died on August 5th at his home, of heart disease.



500 YARDS A MINUTE

Should a single thread break, down goes a Drop Wire and the Warper comes to a full stop in 2½ seconds—without further breakage. This is part of an interesting story.

WHEN you increase production in your carding room or spinning room, you decrease the yarn cost per pound—but it is only when you increase production in your weave room that the output of your mill is increased.

Use Barber-Colman Automatic Spoolers and High Speed Warpers.

BARBER-COLMAN COMPANY

GENERAL OFFICES AND PLANT

ROCKFORD, ILL., U. S. A.

FRAMINGHAM, MASS. GREENVILLE, S. C.

New Progressive Developments In U S Automatics

The new U S "E" Eye

The "E" eye for Draper, Hopedale, and Stafford bobbin-changing automatic looms.

The "F" eye for Crompton & Knowles worsted, cotton, or silk automatic looms.

These two new eyes round out a set of automatic shuttle eyes that enable us to take care of your requirements for any and all kinds of filling.

Satisfied users of our "A" and "D" eyes will find that in the new "E" and "F" eyes, emphasis has been placed on all the good points and principles of easy and positive threading that have made U S automatics so popular.

Mills not now using U S automatics but interested in progressive development should try these latest eyes. You will find that U S automatics will thread any and all kinds of filling easier and better than any eyes you have ever tried before. You will have a hard time tracing mis-threads, mis-picks, and cut filling to U S automatics.

Tension can be controlled in U S automatic eyes as in no others. When increased tension is desired, only in U S eyes will you find the double tension felts.

Ask about the new Davol Tension for Crepe filling.

The Complete Line of U S Automatics

"A," "B," "D," "E," and "F" Eyes, US Wool Eye for Crompton & Knowles Woolen Automatic Looms, U S Right-Hand and Opposite Wind Eyes.

Absolutely tight tips, and the best grips and stock obtainable are features of all U S automatics.

Our plain loom common shuttles for wool, worsted, duck, silk, and rayon are of the same U S uniform quality.

Whatever your needs, there is a U S shuttle that will give you satisfaction.

Shuttles should never be bought on price alone, yet U S prices are attractive.

Let us quote on your requirements

U S Bobbin & Shuttle Co.

Providence, R. I.

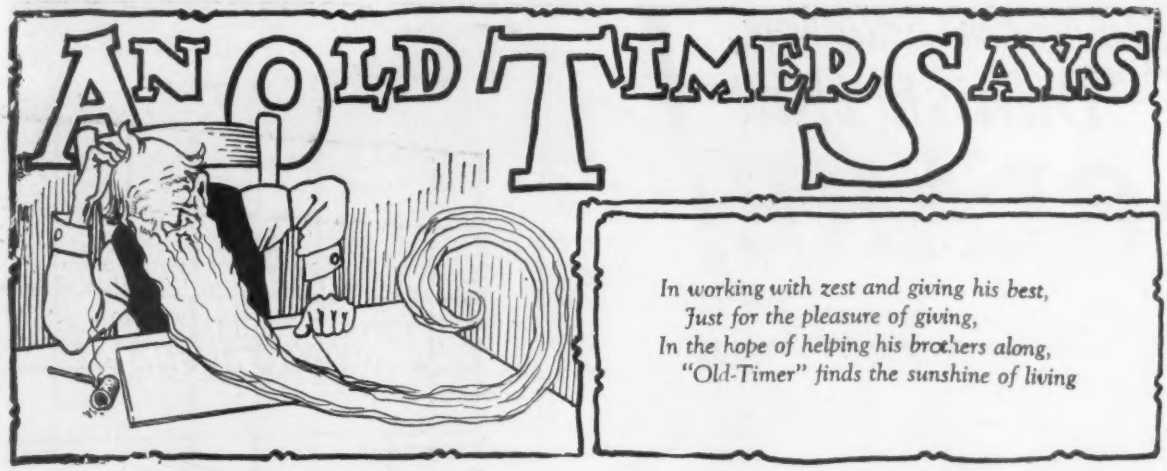
Branch Offices:

Greenville, S. C.

High Point, N. C. Atlanta, Ga. Philadelphia, Pa.

U S Salesmen are specialists on bobbins, shuttles and spools. Order direct from U S for real helpful and understanding service.

BUILDERS OF BETTER BOBBINS, SPOOLS, AND SHUTTLES


AN OLD TIMER SAYS
In working with zest and giving his best,
Just for the pleasure of giving,
In the hope of helping his brothers along,
"Old-Timer" finds the sunshine of living

"Easy now, Old Timer. I have come to apologize. I know it was discouraging to you for me to go to sleep while you were giving me such good information about contracts. I was certainly interested enough to come back tonight and ask you to tell me more about those little points of law that every man should know—"

"Yes, Jim, and most men are just like you—too darn lazy to study a simple course in law to find out; then you expect me to do all the work and studying and tell you the things that will do you some good—"

"Hold on, Old Timer. You are still sore because I took a little nap, and I think you are wrong in accusing me of being lazy. You know I worked like the dickens to learn all those mill calculations you gave me three years ago and then for you to slip off and go to bed and leave me sitting there on the porch asleep in the cold night air. You know I might have taken penumonia or something—"

"I wish you had froze to death. A man that hasn't any more manners; let alone respect—"

"Come on, Old Timer; let's forget it. Pull up that chair, light the old corn cob pipe and let's have some more points on law."

"Well, Jim, probably I did wander off into something that was not very interesting—let's see—if I knew just exactly where I was when you went to sleep I would know where to begin.

"How did you pay the contractor for that house you built, Jim? Did you give him a check on the bank?"

"Sure I did, Old Timer. Is there anything wrong with that?"

"No, that is the best way to handle all business transactions, and your cashed check is about as good a receipt as you can have, providing you make notations on the check so that you can prove that check was given in payment of a certain thing. For example, when you paid for your house it would have been a good idea to have written on the back of the check, just above where the man who receives the money will endorse the check, something like this: 'Received as payment in full for building six-room house on Park Avenue, Hicksville, S. C.'

"Now if the contractor had kept that check two weeks before presenting it to the bank for payment and in the meantime if that bank had failed he would be the loser and not you, because the law would say that he did not use reasonable business judgment in holding the check that long.

"You gave him a check on a bank in which you had that amount of money and it was his duty to present that check within a reasonable time. The law says it is not reasonable to hold you (the debtor) always liable for the money.

"Let me warn you, Jim, if your boss gives you a check for $1,000 bonus because you have done him a good year's work, do not keep the check for several months until you are ready to make an investment or something."

"Several months, did you say, Old Timer? Say, do you think I have gone crazy? Just let him give me that check and I will be standing right at that bank door next morning when the cashier gets there—"

"Well, it is a simple little thing, Jim, and I have known people to hold checks for quite awhile thinking they had a check on the bank and were sure of their money.

"Just remember this piece of advice, Jim, if you go to sleep on me again before I finish this talk: *Never endorse a note for anyone,* not even the best friend you have. In fact, if you have got some good friends and want to lose them, start to lending them money. That sounds pretty hard, I know, but if I only had time I could give you numerous illustrations of homes being broken up; of life long friends starting feuds that have lasted through generations—all from the start of a good friend endorsing another's note or lending him money without security—I mean friendly loans. Where you have sufficient collateral it is, of course, all right, but a man does not offer you collateral when he asks you to endorse his note.

"There is one point of law that every superintendent should know because it may save him from getting into trouble sometime:

"The courts almost invariably say that 'Whoever deals with a person repeatedly employed to do specific things, for example to sign bills, receipts, policies, or to make purchases, is justified in believing him to be authorized to do these acts with the consent and approval of his employer.'

"Therefore, Jim, if you have been giving the traveling salesman little orders for pickers, lug straps, belting, travelers, etc., and those orders have been delivered and your firm has paid for them—then you had better be very careful, because that procedure has established you as an agent for your firm, and should some smooth tongued salesman come along sometime who does not expect to get any future business from your firm, he may trick you into signing an

For More and Better Work

Banish that GLARE!

Shades Needed Here —a Heavy Expense

MODERN mechanical window shade equipment costs a lot of money these days—both for installation and upkeep (repairs and replacements). Then there's the time workers lose in adjusting them to changing light conditions throughout the day.

All this heavy expense can be avoided by simply coating your glass with *SKYCO No-Glare*. It saves its slight cost many times over in one season, by eliminating this heavy shade expense.

SKYCO No-Glare is a sky-blue liquid that you paint or spray on the glass of your windows and skylights. The resulting film of *No-Glare* FILTERS the intense glaring sunlight, letting in 94% of the light but rejecting *all* of the tiring glare and 15° of the heat (actual thermometer tests).

"No-Glare" Saves Cost of Shades Here

Goes on OUTSIDE of Glass—yet rain or weather conditions do not affect *SKYCO No-Glare*. Neither will it rub, or flake off. Yet you can remove it easily with warm water and a brush. *Just as effective if applied on inside of glass.*

Surprisingly Economical

A single gallon covers from 700 to 800 square feet of glass—*No-Glare* costs less than ½c per square foot of glass coated. One application lasts throughout sun-glare season. Guaranteed by the makers of the famous *SKYBRYTE Glass Cleaner.*

Convenient Trial Offer

Used by textile mills everywhere. Sold by mill supply houses. Order a trial gallon today at $3.50 and try it on a "glary" window.

THE SKYBRYTE COMPANY, 1190 Hanna Bldg., Cleveland, Ohio

CHICAGO BRANCH: 104 So. Michigan Ave.

Reduces Heat 10° to 15° — Yet 94% of Light Maintained

SKYCO NoGlare

Gives a Cool Diffused Light that is Restful

order that will amount to several thousand dollars where you only expected it to be one or two hundred dollars.

"I recall one specific instance back in 1904 or 1905 when a German salesman came through this country and would call on a mill and after talking very interestingly to the superintendent or manager about his travels, etc., would wind up by saying he was trying to defray his expenses of touring America by selling tool steel and would the superintendent be kind enough to give him a small order, etc., etc. Well, when the order was received the superintendent or manager would wake up to the fact that he had bought enough tool steel to do his mill for fifty years and that he had a bill that he was afraid to let his boss see.

"The German salesman was, of course, gone. The firm which shipped the steel replied to some of the mills that the man was no longer in their employ and that they had gone to great expense to make up this large order and ship it to America and that they had a bona fide order signed by the man who signed orders for the mill—well, there just wasn't anything to do but pay the bill.

"Be careful, Jim, you never know when a trap is being laid for you.

"The law says that a principal is only bound by the acts of an agent so far as he is authorized to act, but the joker comes in that the extent of an agent's acts is ascertained from facts as well as words.

"If the mill authorities have allowed you to sign little orders the law will in most cases hold you for signing a big order.

"Of course you know, Jim, that a man cannot sell something he does not own—for example, stolen goods. If you buy stolen goods the owner can recover them and you are out your money unless you can get it out of the hide of the thief. I believe there is an exception to this rule of law, but it refers to negotiable paper, but I do not think you will ever be burdened with so much money that you would likely get in trouble buying negotiable paper, so I will not try to explain it—but be careful, Jim, before you buy a second-hand flivver from a stranger.

"Not long ago my wife went into a Piggly-Wiggly store and bought quite a large order of groceries, and as I had the flivver she asked the manager of the store to keep the packages for her until late afternoon when we would call for them. About sun-down I drove up to where I was to meet my wife and she said 'drive by the store so I can get my groceries.' In a few minutes she came out and told me to come into the store with her as the manager said her husband had called for the packages in about thirty minutes after she left them. Well, as soon as I walked in he said, 'That is not the man, because I remember distinctly he had on a light suit.' And I happened to have on a dark one. You see, Jim, some rascal saw her leave that large order of groceries with the manager, heard her give him her name to mark on them and as soon as she was well out of the way he goes in and calls for them. My wife began to raise cain with the manager, saying he had to pay her money back, but I told her no, he did not, because the law says, 'The property has passed to the buyer and the seller becomes the bailee or keeper of them for the buyer. Consequently, their loss, while in the seller's possession, *without his fault*, is the buyer's loss.'

"The manager did give my wife her money back, but according to law he was not compelled to.

"Just like you load a car of cloth or yarn for the man you have sold it to; that is just the same as if you had driven up to his door with a truck and delivered the cloth or yarn to him. Providing, of course, that you have complied with the ordinary precautions in sealing the car, obtaining your bill of lading, etc.

"There you go again, Jim—you are beginning to yawn, and very soon you will be asleep, so I am going to stop until some other night."

"Suits me. Good night, Old Timer."

"So long, Jim."

"The Dyeing of Textile Fibers."

This is the title of a splendid book just published, written by R. S. Horsfall and L. G. Lawrie. It is a very practical volume, which is now available, and which should have an interest for the textile dyer. The book is written in England, but has a universal application. In its preparation, the authors state they endeavored to get away from the common practice of attaching too much importance to dyestuffs rather than the material to be dyed, thus approaching the subject of dyeing through descriptions of the dyes. On the other hand, they have succeeded admirably in their effort to approach the subject from a different angle, from that of the material to be dyed; by describing either the manufacturing processes which such material still has to undergo, or the final uses to which the dyed material is to be put.

The dyeing of cotton, in raw form, warps, and piece goods, and the treatment and dyeing of wool, silk and rayon are covered, in a very practical way. The subject of testing dyestuffs receives consideration, as does the matter of protecting agents. An appendix gives a list of the chemicals used in the dyeing industry, and sundry tables. The price of the book is $9.00 per copy. Copies may be secured through COTTON'S book department, or direct from the publishers, D. Van Nostrand Company, 8 Warren St., New York City.

Organize Fernald-Jenkins, Inc.

Howard L. Jenkins, Brackett B. Fernald and Cornelius Castaline have incorporated the firm of Fernald-Jenkins, Inc., manufacturing chemists, located at Phillipsdale, R. I. Mr. Jenkins has been associated with The Fleischmann Company for the past five years, handling Diastafor, and the new concern has been appointed sole agents in the United States for the Fleischmann Company. Mr. Fernald has been chief chemist and superintendent of the United States Finishing Company, having also held a similar position with the Imperial Finishing and Printing Company. Mr. Castaline has been superintendent of the Jacques Wolf Company, Passaic, N. J., for a number of years.

Laurel Occupies New Plant.

Laurel Soap Manufacturing Co., Inc., Wm. H. Bertolet & Sons, Philadelphia, Pa., have announced their removal into their new plant at Tioga, Thompson and Almond Sts. The new quarters, which more than treble the former plant, include a modern laboratory, and the production and service on Laurel Brand textile and industrial soaps and oils has been greatly increased.

W. L. ALLEN is now overseer of weaving at the Stevens Manufacturing Co., Burlington, N. C. He formerly was superintendent of The Horn Company, Spindale, N. C.

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HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all. will be properly edited before publishing. The editors

Preventing Rust on Steel Heddles.

EDITOR COTTON:

I would like to hear from some of the readers of COTTON as to how to clean that part of a steel heddle which is not touched by the warp. We brush the heddles when the harness comes back from the weave room, but they are rusty from the heddle bar down about 2 to 2½ inches, and this rust will injure the heddles in time.

Will the readers using steel heddles please describe their methods for doing this cleaning? M. E. (S. C.)

Making Even Yarn.

EDITOR COTTON:

I notice in the February issue that "Contributor No. 1034" wants to know how to keep his yarn even.

As we all know, we must find out from where the trouble starts. If we don't know this, it is impossible to rectify it. Possibly several things contribute to this unevenness of the roving and yarn.

The contributor states that the roving and spinning are continually jumping. This is proof enough that the cause precedes the processes. As he states, he does not have adequate humidity, but I do not think this is the real cause, for this reason: Most overseers do their reeling and sizing at approximately the same time each day. The relative humidity at the same time each day will be approximately the same, taking an average week in and week out. Of course reason must be used in extreme weather. Therefore the uneven yarn and roving must be the result of unven work in previous processes. No roving or spinning frame has ever been made that will make uneven yarn even.

The last process at which this can be done is the finisher drawing-frame. However, we must start before this, namely, in the picker room.

"Contributor No. 1034" does not state what staple he is using. I would imagine, seven-eights of an inch to one inch cotton and possibly 1 1/16-inch for the highest counts. He does not state whether he has any opening equipment or not. While the bale breaker and vertical opener take out a lot of dirt, sand, and leaf, it is my opinion that it would get taken out in the scutchers anyway. These machines have a great tendency to dry out the cotton, and inasmuch as he is short on artificial humidity, he will be better off without these machines.

He has three processes of picking, which should result in first-class work for the staple named, both in regard to cleanliness and evenness. I hope he is fortunate enough to have evener motions on his breaker pickers, because right here is the place to start even work. Make sure it is clean and in good shape. He should make sure the draft flues are not plugged up, or one side open and the other side closed. This would have a tendency to produce a one-sided lap, and a one sided lap always runs uneven. Be certain the evener motions on the intermediate and finisher pickers are running freely and cone belts are in good condition. The calender rolls should be scoured every six weeks, to secure free running and clean running. The blades of the beaters should be kept sharp. I would prefer a Kirschner beater for the finisher lappers. Run the beaters at a moderate speed, and if using Kirschners, make sure the speed is cut down in proportion.

The picker boss should weigh every lap, and if one varies a fourth of a pound it should be regulated. If it varies a half pound or over it should be run through again. Make sure this is done, because if the laps are even, half the battle is won. Right here is part of the trouble.

The overseer should have a frame made forty or forty-five inches long, according to the width of the lap, and one yard wide. Occasionally a lap may be rolled on the floor, being careful not to stretch it. Cut off several one yard lengths, then weigh them up and see how even a lap is being run. If it varies much the evener motions and the picker boss should be looked after P. D. Q. (please do quick).

Coming to the card. I would advise a fairly long draft of around 110 and a moderate sliver of about 50 grains. This will give the cleanest and evenest work. Set the flats fairly close to a .007 gauge for 40-inch cards or a .009 gauge on 45-inch cards.

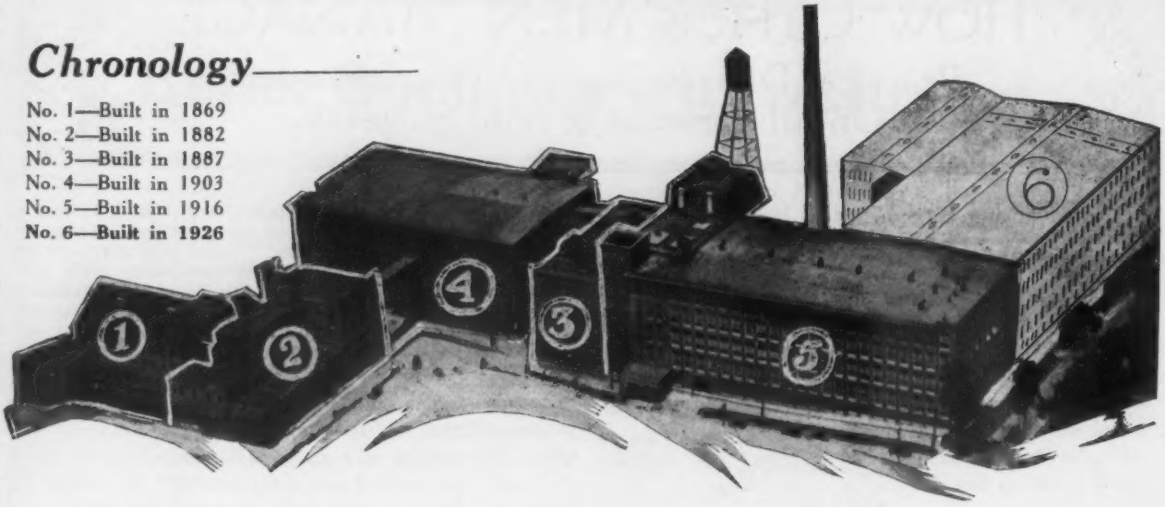
Have the strippers use precaution when stripping and piecing up. This can be drilled into them if one is persistent. Stop that everlasting evening up of laps. This continual piecing of laps when the set is running out makes as much uneven work as anything I know of. No two laps are exactly alike and never will be. I have seen strippers unroll yard after yard and leave it to be pulled up by the lap roll from the floor. This means there is over a pound dragging from the lap roll all this time. It would be far better to break it off and throw it back into the picker than to let it stretch from the floor. Have this way of handling cut out. It will be a hard battle, but it will pay.

Coming to the drawing frames we have a section of as much importance as any in the entire mill as here is the last real place to do any evening.

The stock should not be drafted much over five on this class of work. The finisher sliver to be about 70 grains. Make sure the spoon motion or electric stop motion is in good order. Always bear in mind that this is the last evening which can be done and the frame must stop when an end breaks.

Chronology

No. 1—Built in 1869
No. 2—Built in 1882
No. 3—Built in 1887
No. 4—Built in 1903
No. 5—Built in 1916
No. 6—Built in 1926



City of Consistent Success

THIS airplane photograph showing the successive stages of growth of a large textile manufacturing enterprise is typical of the hundred other successful plants at Columbus, Georgia—a modest beginning and steady growth. This city has never lost a factory by failure. There have been over thirty factory enlargements here in the last two years, and within the last six weeks four big additions have been announced—two by textile mills and two by other lines of manufactures. Let us tell you in confidence how conditions at Columbus may be fitted into your plans for the future.

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Very low building costs
Pure, soft river water
Absolute freedom from malaria
Pure drinking water supply
Plenty of low rental houses
Efficient street transportation
Fine churches and schools
Bonds voted to pave all main roads
Friendly public sentiment
Mild winters and summers

Five Years Tax Exemption

Columbus Electric & Power Company

STONE & WEBSTER, Inc., Executive Managers.

Columbus, Georgia

The third hand in charge here should be made to scour two frames weekly, and keep the top rolls well varnished.

Go around to the back of the frames and look at the back steel rollers. Are they completely lapped with clean waste? Have these rolls cleaned and kept clean, as this causes the diameter of the rolls to increase unevenly and results in uneven drafting.

Size the finisher drawings twice daily, about 9:30 A.M. and 3 P.M., and if there is much variance, change to meet it. Keep the sliver OK, and the roving and spinning will not be changed very often. No one can tell another how to regulate his changing and sizing. This must come by experience, by watching the weather, the section beams, the cloth averages, and last, but by no means least, use common sense. Suppose the standard called for a 40 tooth change gear to produce a 60 grain sliver. One tooth would be equal to 1.5 grains and changes should be based on such fact.

Of course the humidity will come in here a great deal, but here is a way to get around it. Some day when the weather and humidity are satisfactory and the work is even, weigh out 100 grains of this even sliver. Roll it up ball shape and tie it firmly with as little yarn as possible. Hang this up where the sizing is done. At every sizing blow it lightly to blow away any fly that may collect on it. Then weigh it. Today may be damp, and if this normal 100 grain ball weighs 102.5 grains. We will know this means 2½ per cent gain due to dampness. Then we will expect the sizing to go to 2½ per cent heavy. If it does, one will know enough to let it alone, as it will dry out as the weather changes. Use this ball when sizing for the roving and spinning also.

I know this will work out satisfactorily where no humidifiers are used to balance the unevenness of the natural humidity.

Before leaving the drawing frames let me advise the reader to look over his gears on the drawing frames, because one or two wrong gears could cause the entire trouble.

A draft of four or a little less would be about right for the slubbers and make around .50-hank roving. This would leave good drafts for the roving frames.

Using single 1.00-hank to make 3s is wrong. The draft is too small and would make jumpy yarn. I would favor making this from the .50-hank slubber roving, although the 1.00-hank double could be used to the same advantage. Six of a draft is small enough.

In this contributor's fourth paragraph, referring to the weight on the rolls changing, as to the humidity, he is theoretically correct, but I think he is stretching his imagination if he thinks he can notice it.

If the work is slipping through the rolls it must be either poor rolls or too much oil (?). Something must be causing them to lag. If using solid or shell rolls he must nag all the time or they will never get oiled. Ball bearing rolls are the only things. I wouldn't want to be without them.

In the next paragraph the contributor speaks of being like a dog at the corner of the fence. This is no way to be. Constant changing of gears is not right. If the work comes heavy take it down easy. Control the weights as you would like to see it on a chart—in graceful curves, not jerks.

I hope this will help a little. I think that the trouble is in the picker room and on the drawing frames with the cards helping. My advice to "Contributor No. 1034" is that he fix these and see if the spinning doesn't come better.

CONTRIBUTOR No. 596.

Making Better Yarn.

EDITOR COTTON:

On page 137 of the December 1926 issue you published a question from me with reference to pods and small impurities in our 40s carded yarn made from 1 5/16-inch Upper Egyptian staple. These impurities showed up in the winding, with no trouble in spinning. I explained we had adjusted the grids on the pickers, and speeded up the card flats from 2¼ to 3¾ inches per minute with no improvement in the yarn. I gave my lay-out and card settings in that letter. I explained that we make an 18-ounce breaker lap, doubling three into the finisher for a 12¼-ounce lap.

In the February 1927 issue, on page 353, "D.E.(R.I.)" made some interesting suggestions as to the probable causes of my trouble, indicating he had found these pods and small impurities in yarn to come from the cards, where the strippers were allowing the ends to run into the cans without breaking them at the coiler top, hence the end was pieced up at the calender rolls where a great amount of small impurities covered the portion where the piecing was made. He also urged care and caution in cleaning the cards. Also, he suggested that we reduce our breaker lap to 16 ounces, and double four on the finisher. He requested our drawing lay-out.

I acknowledged these suggestions on page 573 of the April issue, explaining that I would carry out his suggestions with reference to cleaning, etc., and furnishing our drawing lay-out in that issue.

I received another reply, signed "Contributor No. 559", and published on page 707 of the May issue. This man failed to see any advantage is increasing the flat speeds, as I had reported in my first letter. He said the draft on the finisher picker was all right, but he also suggested doubling four instead of three. He suggested that the small portions of yarn with no twist in them, as I had mentioned in the December number, might be caused by excessive roller drafting or rolls not oiled and therefore lagging.

He suggested that I give my lay-out to spinning, and that I reduce my flat speed.

Summing up this discussion, I wish to thank these gentlemen for their helpful replies. In connection with the suggestion to double four laps on the finisher, I personally prefer this method but the owners of the mill in some way or other are determined to use the three laps up on the finisher. They state with four doubled there will be too big a draft with a breaker lap of 18 ounces, and any less weight of breaker lap on a 46-inch width machine gives a poor lap. I would be obliged if "D.E.(R.I.)" and "Contributor No. 559" would give their opinions on the draft being considered too high.

I will follow the suggestions offered about setting closer on the cards, and hope it will make an improvement. In response to the request, our lay-out, to the speed frames, is as follows: Card sliver, 150 grains in 3 yards; first drawing sliver, 163 grains in 3 yards; second drawing, 176 grains in 3 yards; third drawing, 190 grains in 3 yards; slubber roving, 336 grains in 30 yards; intermediate, 112 grains in 30 yards; 8.00-hank roving, 31¼ grains in 30

yards. All 1¼-inch rollers on fly frames.

I might add that since I asked the question in the December issue I slowed the card flats down to 2¾ inches per minute, as no difference was noted with the faster speed as your contributors thought would be the case.

The suggestion regarding the little pieces of yarn without twist will also be carried out to see if we can effect an improvement.

CONTRIBUTOR NO. 1019.

Why Cloth Varies in Stretch.

EDITOR COTTON:

This refers to the question from "L.C.S.(Alabama)", as to why two cuts of cloth, woven on the same loom from the same set of warp yarns, will vary in the amount of stretch.

If "L.C.S." will cut a number of test pieces from across the width of the cloth, no two pieces including the same ends, and test these pieces in a power driven testing machine, he will find that there is a difference in the amount of stretch. That is, there is not only a difference in elasticity for different cuts of cloth, but also a difference at different places in the same cut of cloth, and a difference for different ends in the same six inch length of cloth.

And so the question as to why two cuts of cloth vary in the amount of stretch is largely the same as to why two wrappings of the same yarn vary in amount of stretch and breaking strength.

I do not believe that the loom has as much to do with the elasticity being left in, or taken out of, the yarn, as do the spooling warping and slashing, processes. A few ends, or all the ends, in a warp, can have a big portion of the elasticity taken out of them at these processes, and so affect the stretch in the cloth made later from these ends. Rough steps in the warper creel, worn skewers, worn spools, high and low places in section beams, uneven sizing, and over-stretching at the slasher, are some of the reasons for unequal elasticity in the yarns that reach the loom.

If two cuts of cloth are woven on the same loom, with the harness set the same in each case, and the take-up and let-off gears working the same, the action of the loom would not have much bearing on the difference in stretch in the two cuts of cloth. If the humidity in the weave room varied a great deal at different times, the tension on the warp in the loom would vary as often and so cause more or less loss of elasticity. With the humidity approximately the same at all times during the day, and the loom settings the same for the two cuts of cloth, "L.C.S." should search the preceding processes for causes of uneven stretch.

J.W.C. (TENN.)

EDITOR COTTON:

The question of "L.C.S."(Ala.)", in a recent issue of COTTON, asking why two cuts of cloth woven on the same loom will vary in the amount of stretch, is not quite plain to me. He does not say where the stretch he refers to comes—whether while weaving on the loom, at the bleachery, etc.

If he refers to stretching while weaving on the loom, the following may be of interest:

If he weaves two cuts of cloth on the same loom, same yarn, pick, and sley, and has a friction or Draper Roper let-off, then there should be no difference in the length of the cuts from cut-mark to cut-mark. But if he has a Bartlett let-off, the first cuts off the warp will be shorter than those near the empty beam unless he keeps loosening the let-off spring as the warp gets smaller. The reason for this is that as the warp gets smaller, it gets tighter and narrower; that is, the cloth gets narrower and tighter. Therefore, the only thing to do, if he had this let-off, is to have his men look after the tension as the warp gets smaller.

P.T.S. (MAINE)

EDITOR COTTON:

In reply to "L. C. S. (Ala.)," who asked in a recent issue as to why two cuts of cloth from the same loom and the same set of yarn will vary in the amount of stretch.

It is my belief that the main reason is due to the varying tension of the friction of the mechanism that winds the yarn on the slasher. You start out with the yarn on the empty beam of the loom beam with the weight on the friction let-off of the slasher run in, and the slasher tender is supposed to keep moving it out as the leverage varies due to the increasing size of the yarn on the loom beam. Well, it is not humanly possible for any man to keep this weight so that the same amount of tension is applied constantly. We have thus a varying tension on the yarn which stretches it more or less as the case may be, and when it is woven up we have a varying stretch on the cloth due to the fact that a varying amount of stretch has been taken out of it on the slasher by this tension device.

In the study of steel and other materials there is a factor known as the modulus of elasticity. This modulus of elasticity in simple terms means the amount of stretch that you can give a given material and it will return to its original condition. However, if you pass this modulus of elasticity you stretch the material to a point where it does not return to its original condition and consequently there remains a varying degree of elasticity. Apply this theory to the yarn and you have the reason why with this varying tension and low modulus of elasticity of cotton yarn that the finished cloth will vary in stretch. There is a device made by an English concern that pushes the weight out on the friction arm according to the diameter of the beam being filled. I have seen this attachment in a New England mill. It may solve "L. C. S.'s" trouble.

J. R. W. (N. C.)

EDITOR COTTON:

With regard to the question of "L. C. S. (Ala.)" as to why two cuts of cloth woven from the same warp in the same loom will vary in the amount of stretch, I assume that he refers to the stretch in cloth during finishing, and my answer is made with that thought in mind.

I am of the opinion that the source of his trouble is in the humidity of the weave shed, and by this I do not necessarily mean his humidifying system, but rather some local condition that brings more humidity into the weave shed during one time of the day, or week, than at other times. For instance, a spell of two or three days of rain followed by dry weather would show a marked difference in the amount of humidity present in the weave shed during the wet spell and during the dry weather. Again, if the weave shed is located adjacent to or near a body of water of any size the wind when blowing from the water towards the weave shed would bring considerable additional humidity into the weave shed.

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This Overseer Wanted to Prevent Roving Waste

This is what he wrote to The Textile American: "How can we prevent an excessive amount of roving waste being made? It seems to me as though more roving is left on the bobbins than there should be and which is cut off the bobbins. This makes a lot of waste and cut waste reduces the quality of the yarn. I would like to learn of some method of preventing this."

July TEXTILE AMERICAN Told Him How

This is the answer that appeared in the July Textile American: "This overseer is having some trouble which can be avoided. There is now no need to cut roving off bobbins. The Terrell Machine is one of the best that has been made for this purpose and will soon pay for itself in two ways. First by preventing cut roving, second by preventing cut bobbins. Every overseer and superintendent knows the effect of cut roving being worked up with the cotton, especially if too much is used. Waste is an expensive luxury and I am unable to see why any superintendent will use waste with good cotton, as this tends to reduce the quality of the cotton used. There is no question about the trouble that is caused by cut roving bobbins and the sooner a mill stops this practice the better it will be for the mill. The help will have to be trained so that they will not take out a bobbin with more roving left on the bobbin than is necessary. I have seen bobbins taken out with as many as five layers of roving on them, which is a waste, especially if cut off the bobbins. It is up to the overseer to see that the men do their work properly and not pick up bobbins with too much roving on them."

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With the foregoing statements well in mind, it is seen that a cotton warp containing an excessive amount of humidity will stretch, under tension, more than a second cotton warp of the same count of yarn and number of ends but containing less humidity. After leaving the looms and going to the cloth room, or subsequent process, the cloth from these two warps will contract in length as they dry, *but the cut of cloth from the first warp will not contract as much as the cut of cloth from the second warp.* Thus, it is found after finishing that there are more yards between the cut marks of cloth from the first warp than there are yards between the cut marks of the cloth from the second warp.

From the foregoing the inquirer can conclude that to control this stretch some means of controlling the humidity of the weave room should be introduced, so that when rain, or some other condition, brings an excess of humidity into the weave shed the amount of humidity being blown in by the humidifiers would be automatically lowered.

H. A. (MAINE).

EDITOR COTTON:

This replies to the question of "L. C. S. (Ala.)" who asked in a recent issue why two cuts of cloth woven on the same loom with the same warp will vary in stretch. I am making four assumptions in answering: 1st, that the settings of the loom are the same while weaving both cuts of cloth; 2nd, that the same reed is used in weaving both cuts of cloth; 3rd, that the humidity conditions in the weave room are the same while weaving both cuts of cloth; and 4th, that the variation in stretch found is more than normal.

I have found in weaving fabrics that the width will vary considerably on the loom if the weavers are not trained carefully on this point and when all other conditions are the same a variation in the width of a fabric will cause a variation in the amount of stretch.

In weaving heavy duck, 54 or 60 inches wide, I have seen variation in width from one inch under to one inch over the specified width. With the width of the cloth one inch under standard, the tension of the loom is much tighter than when the width of the cloth is one inch over standard. The results in either instance would be to weave two almost entirely different pieces of cloth, and the stretch, break, weight and gauge will be different in each instance.

NEMO (GA.)

EDITOR COTTON:

What makes two cuts of cloth woven on the same loom from the same warp vary in the amount of stretch? This question was asked in July COTTON by "L. C. S. (Ala.)"

I take it for granted he means that the varying amount of stretch is in the length of the cloth. He does not say what kind of cloth or how it is finished. This, of course, opens the way for a more general discussion on the subject, which perhaps will be best.

With the chain and weight and lever let-off, I think this could be easily explained. Sometimes careless weavers will weave two or three cuts of cloth without adjusting the weights, so the warp will gradually tighten up as it runs down and this takes quite a bit of the elasticity out of the warp and the last cut of cloth woven before re-adjusting the weights will not stretch as much as the first cut.

Another thing that will cause this, unless the humidity system is A-1, is that a weaver will start in the morning with plenty of humidity and possibly a little on the wet side. The work will run good, though the warps are tight and there is not much elasticity left in the cloth. By evening it is dry and the work is going bad and the next thing is the warps are loosed up as slack as they will run.

My idea of correcting this is to know just what width to make the cloth on the loom and go around about four times a day and measure the cloth, beginning the first thing in the morning, and adjusting the weights to make the cloth the proper width. The tighter the warp is run the narrower the cloth will be and the less stretch it will have.

Another cause, if the goods are sized, is in slashing. If the slasher tender does not make any adjustment on the warp tension as he runs a warp, there is part of the trouble. The last cut will not be stretched as much as the first one he puts on. The slasher cylinders should work freely and not bind anywhere to throw more strain on the warp, and the bearings on all the small guide rolls about the slasher should be kept well oiled.

Another small thing: If he doesn't know the cloth is varying in stretch, that is, if he is judging by the different lengths of cuts, it would be well to look over the cut marking mechanism. The marker may hang just a little sometimes and make two or three yards difference.

It might be well to look over the finishing processes and see if there is any possibility of stretching a part of the cloth more than the rest.

This is just another thing about the cotton mill we have to keep after continually. A job is not going to run itself all of the time, and the only way to do is not "get in behind it", but "get in ahead of it and stay there". I believe "Old Timer" has told us this before, but it will bear repeating and remembering.

And thanks for the "How Other Men Manage" department in COTTON; just for the asking we learn where to "head in" on our problems.

JACK (TEXAS)

Repairing Flyers.

EDITOR COTTON:

In the September issue of COTTON "D. E. (R. I.)" claims that I am the one who missed the point regarding worn pins in flyers on fly frames. Let us see how much "D. E." knows about fly frames. In the third paragraph he states: "So I would like 'Wash' to consider the question again, and understand that worn pins in flyers are not the real cause of 'shaking' flyers, whether it be on a bobbin or flyer lead frame."

In the flyer-lead frame, a worn pin will lag behind the speed of the spindle, or rather the impetus given to the flyer on starting the frame. This will slacken the end, for the reason that the bottom cones take revolutions from the bobbins.

On the bobbin-lead frame, the bobbin leads, so a worn pin causes the flyer to lag behind, and stretch takes place.

"D. E." understands fly frames, but not the systems of winding-on. That is the point that the concern in question missed. The flyer may be worn in the let-on, but if the pin fits the slot of the spindle as it should, no stretch will take place. A shaky flyer is much preferred to one that will cause stretch. That is the point I made.

With the foregoing statements well in mind, it is seen that a cotton warp containing an excessive amount of humidity will stretch, under tension, more than a second cotton warp of the same count of yarn and number of ends but containing less humidity. After leaving the looms and going to the cloth room, or subsequent process, the cloth from these two warps will contract in length as they dry, *but the cut of cloth from the first warp will not contract as much as the cut of cloth from the second warp.* Thus, it is found after finishing that there are more yards between the cut marks of cloth from the first warp than there are yards between the cut marks of the cloth from the second warp.

From the foregoing the inquirer can conclude that to control this stretch some means of controlling the humidity of the weave room should be introduced, so that when rain, or some other condition, brings an excess of humidity into the weave shed the amount of humidity being blown in by the humidifiers would be automatically lowered.

H. A. (MAINE).

EDITOR COTTON:

This replies to the question of "L. C. S. (Ala.)" who asked in a recent issue why two cuts of cloth woven on the same loom with the same warp will vary in stretch. I am making four assumptions in answering: 1st, that the settings of the loom are the same while weaving both cuts of cloth; 2nd, that the same reed is used in weaving both cuts of cloth; 3rd, that the humidity conditions in the weave room are the same while weaving both cuts of cloth; and 4th, that the variation in stretch found is more than normal.

I have found in weaving fabrics that the width will vary considerably on the loom if the weavers are not trained carefully on this point and when all other conditions are the same a variation in the width of a fabric will cause a variation in the amount of stretch.

In weaving heavy duck, 54 or 60 inches wide, I have seen variation in width from one inch under to one inch over the specified width. With the width of the cloth one inch under standard, the tension of the loom is much tighter than when the width of the cloth is one inch over standard. The results in either instance would be to weave two almost entirely different pieces of cloth, and the stretch, break, weight and gauge will be different in each instance.

NEMO (GA.)

EDITOR COTTON:

What makes two cuts of cloth woven on the same loom from the same warp vary in the amount of stretch? This question was asked in July COTTON by "L. C. S. (Ala.)"

I take it for granted he means that the varying amount of stretch is in the length of the cloth. He does not say what kind of cloth or how it is finished. This, of course, opens the way for a more general discussion on the subject, which perhaps will be best.

With the chain and weight and lever let-off, I think this could be easily explained. Sometimes careless weavers will weave two or three cuts of cloth without adjusting the weights, so the warp will gradually tighten up as it runs down and this takes quite a bit of the elasticity out of the warp and the last cut of cloth woven before re-adjusting the weights will not stretch as much as the first cut.

Another thing that will cause this, unless the humidity system is A-1, is that a weaver will start in the morning with plenty of humidity and possibly a little on the wet side. The work will run good, though the warps are tight and there is not much elasticity left in the cloth. By evening it is dry and the work is going bad and the next thing is the warps are loosed up as slack as they will run.

My idea of correcting this is to know just what width to make the cloth on the loom and go around about four times a day and measure the cloth, beginning the first thing in the morning, and adjusting the weights to make the cloth the proper width. The tighter the warp is run the narrower the cloth will be and the less stretch it will have.

Another cause, if the goods are sized, is in slashing. If the slasher tender does not make any adjustment on the warp tension as he runs a warp, there is part of the trouble. The last cut will not be stretched as much as the first one he puts on. The slasher cylinders should work freely and not bind anywhere to throw more strain on the warp, and the bearings on all the small guide rolls about the slasher should be kept well oiled.

Another small thing: If he doesn't know the cloth is varying in stretch, that is, if he is judging by the different lengths of cuts, it would be well to look over the cut marking mechanism. The marker may hang just a little sometimes and make two or three yards difference.

It might be well to look over the finishing processes and see if there is any possibility of stretching a part of the cloth more than the rest.

This is just another thing about the cotton mill we have to keep after continually. A job is not going to run itself all of the time, and the only way to do is not "get in behind it", but "get in ahead of it and stay there". I believe "Old Timer" has told us this before, but it will bear repeating and remembering.

And thanks for the "How Other Men Manage" department in COTTON; just for the asking we learn where to "head in" on our problems.

JACK (TEXAS)

Repairing Flyers.

EDITOR COTTON:

In the September issue of COTTON "D. E. (R. I.)" claims that I am the one who missed the point regarding worn pins in flyers on fly frames. Let us see how much "D. E." knows about fly frames. In the third paragraph he states: "So I would like 'Wash' to consider the question again, and understand that worn pins in flyers are not the real cause of 'shaking' flyers, whether it be on a bobbin or flyer lead frame."

In the flyer-lead frame, a worn pin will lag behind the speed of the spindle, or rather the impetus given to the flyer on starting the frame. This will slacken the end, for the reason that the bottom cones take revolutions from the bobbins.

On the bobbin-lead frame, the bobbin leads, so a worn pin causes the flyer to lag behind, and stretch takes place.

"D. E." understands fly frames, but not the systems of winding-on. That is the point that the concern in question missed. The flyer may be worn in the let-on, but if the pin fits the slot of the spindle as it should, no stretch will take place. A shaky flyer is much preferred to one that will cause stretch. That is the point I made.

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However, I agree with "D. E." concerning replacing of pressers on flyers. The readers will remember that I gave the same preachment. Flyers should be sent to a flyer shop, where they can be properly repaired and balanced.

WASH (R. I.)

Answers to Fly Frame Questions.

EDITOR COTTON:

I am going to try to answer some of the questions on fly frames asked by "T. A. A. (S. C.)" in the January number of COTTON.

On a change of weather from good conditions to rainy weather we find that the ends on the fly frames begin to sag, and as the atmosphere becomes saturated the work runs bad. Why?

We all know that cotton will absorb a great deal of moisture, and in damp weather it absorbs more than is good for good running work. But when this cotton takes up moisture it is noticeable that it expands in length as well as in the cross section, in fact, more so. In rainy weather it will stretch fully one-eighth of an inch to the inch.

Let us assume that we are running one-inch cotton, and the weather changes suddenly. The cotton expands to 1⅛-inch for every inch. It can readily be seen what causes the ends to sag, and it will require more than one or two teeth changes of the tension gear to let the rack out fast enough.

I think this shows that the frame is not imperfect. It is just plain common sense.

In reference to roving being packed away, I am surprised that "T. A. A." reports that it runs poorly. I have always found that roving packed away for a time and then run up, runs a little better than newly made roving. I believe that the twist in roving packed away settles and that the strands even up. That sounds peculiar, but when we run roving that has been packed away for some time we get our most uniform work. This may be in the way we pack our roving. We have bins that hold 1200 bobbins. This is packed in, not thrown in. Sometimes the first layer runs bad, but we have always been able to trace this to the ones who packed the roving in the bin.

In making roving out of 60-grain and 63-grain sliver, I will say that while in the slubber the surface velocity of the bobbin will be practically the same for the first one or two layers, but as the diameter of the 63-grain sliver is the greater, it will wrap on and eventually make a larger bobbin. Consequently, the coarser bobbin when ready to doff will have a larger circumference and therefore have a larger surface velocity. In the speeder creel they will run out together as nearly as any two bobbins will, as they both have practically the same yardage on them.

The foregoing is assuming that the frame was drafted to take a 60-grain sliver. If the frame were drafted for the 63-grain sliver and had some 60-grain ends running in, the 60-grain sliver would have the greater surface velocity. This is so because the rack lets out too fast for the lighter stand and makes a soft bobbin. We all know that a soft bobbin has a greater diameter, as each time the rack lets out the bobbin wraps on looser and looser. Hence the soft bobbin. If it were possible to run a soft bobbin, there would not be found much variation in the length.

Whether this defect is made on the drawing frame, or

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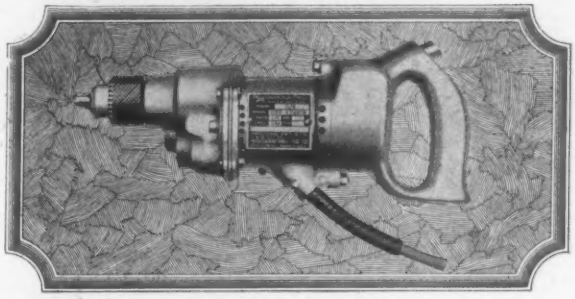

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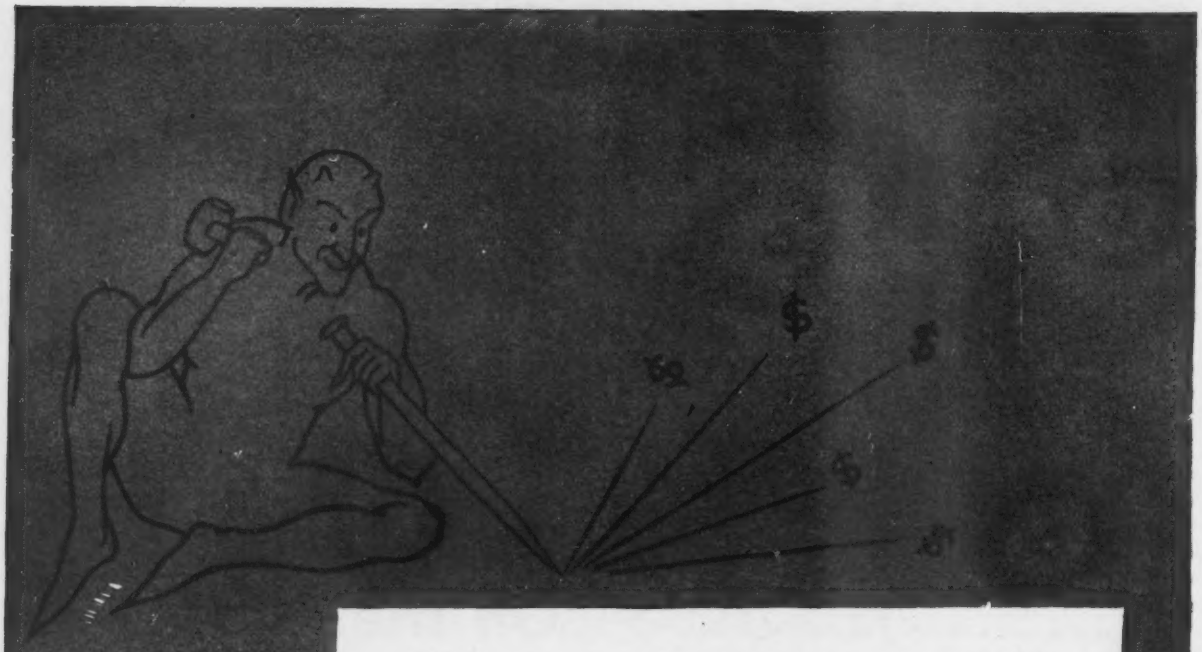

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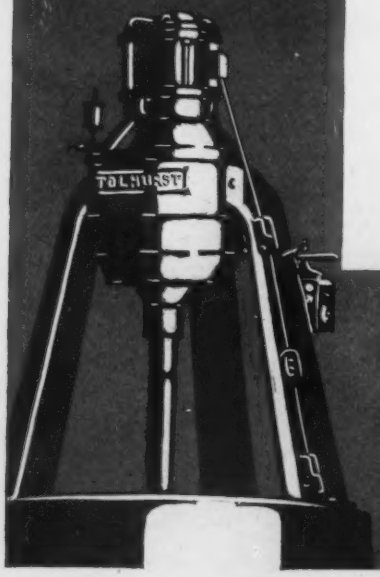

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picker, we cannot say for sure. The man himself can find that out by sizing a yard piece of the lap, and if there is only a normal variation, the trouble will be in the drawings. Size them twice daily and keep them even.

If this trouble is not corrected before the work gets to the fly frames it cannot be done. No fly frame ever made will even up uneven work.

CONTRIBUTOR NO. 551.

EDITOR COTTON:

In the January, 1927, issue of COTTON, "T. A. A. (S. C.)" puts the following questions:

(1) He wishes to know what causes the reverse running conditions of a bobbin-lead fly frame when atmospheric conditions change from 80 degrees F., with 9 degrees depression and a relative humidity of 64 per cent, to 5 degrees depression and 79 per cent relative humidity, same temperature. The answer is easy.

The change is due to the change in atmospheric conditions. The bobbin-lead fly frame has faults enough without blaming it for changes in atmospheric conditions.

(2) "Why is it that the flyer or bobbin-lead frame must be run with a higher tension when run at shop speed than at 20 per cent under shop speed."

"T. A. A." is wrong. The flyer-lead should not be included in the above question. The cause is due to the pressure of the paddle. The higher the speed the more the pressure, and the more the layers on the bobbin are condensed. This causes a slack tension, and the tension gear must be changed to one giving a smaller movement to the rack, which "T. A. A." terms a higher tension.

The faster the bobbin-lead frame is driven the more the cone belt will slip. The new differential motion proves that. Fly frames equipped with the Houldsworth compound have equal speed, while all others must have a high speeded bottom cone. See the point?

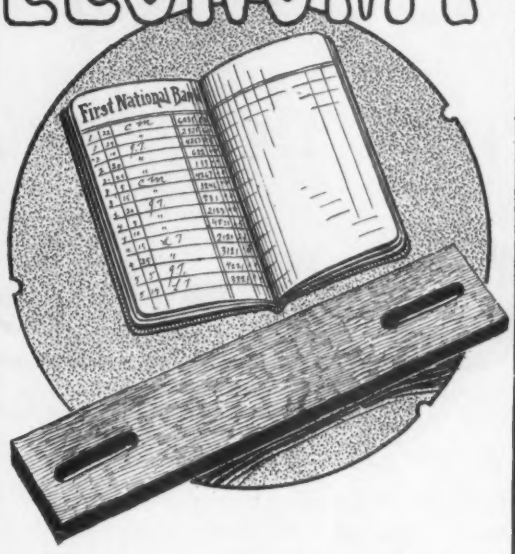
When a flyer-lead frame is driven at a higher speed, the tension is not affected as much and for two reasons: (1) The flyer leading the bobbin has a tendency to take the bobbin around with it, which greatly aids the cone belt, and of course less slippage takes place. (2) The direction of the presser finger causes less pressure.

(3) "Why is it that roving made under good conditions and stored away in a good dry place will give much trouble in the spinning? It will break back, fall apart, and produce thick and thin yarn. What causes this? Remember the roving was okeh."

If roving is made in an atmosphere of say 65 per cent relative humidity, and then packed in a dry place, it will cause the strand to expand and make it "oozy," which results in a soft bobbin. The direct result of changes in the humidity and temperature of the atmosphere is a corresponding change in the amount of moisture hygroscopically contained in the fibers exposed to it, which in turn effects a consequent and relative change in their physical condition. These physical changes are mainly in the nature and amount of the twist in individual fibers and in the extent of their brittleness or pliability, as the case may be. When it becomes necessary to pack roving, a pair or so of frames should be changed to one tooth extra twist.

(4) "What difference will there be in the surface velocity of two bobbins of roving produced at the same time, one being made from a 60-grain and the other from a 63-grain sliver. What will be seen in the speeder creel?"

ECONOMY



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Is this defect in the slubber or is it in the drawing frame or picker? Will the flyer-lead frame correct this? It depends (1) on the nature of the stock, and (2) on the tension of the frame. In the case of strong wiry stock, with the staple longer than the distance from the eye of the presser pad to the surface of the bobbin, this will hold the relationship between the cones and the flyers, but of course the heavy strand will make a hard bobbin. If run with a slack tension then the difference in surface velocity will be corresponding to the difference in the diameter of the bobbins. Nothing new will be seen in the speeder creel. All bobbins from the bobbin-lead system will show a difference of over a layer in length. The cause of the defect generally is found in an uneven sheet of lap.

Again, the defect may be due to low doublings preceding the slubber. "T. A. A." should know better than to ask if the flyer-lead frame will correct this defect. It is just as foolish to ask if a derrick can remedy the variation in the rope wound upon it. The flyer-lead is just a system of winding the strand upon the bobbin, and of course winds the strand as constructed, but in no way can it be connected with the construction of the strand. In case of the bobbin-lead, due to its unequal conditions that I am pointing out, it will receive an almost perfect strand from the drawing rolls and spoil it in spots due to the defective factors that this system embodies.

(5) "Why is it that to obtain a good breaking strength in the spun yarn, just enough twist must be put in the roving to prevent its becoming strained in the spinning creel? This is a known fact, where the skewers are well pointed and in good running condition."

I beg to disagree with "T. A. A.," for it is not a well known fact that to obtain a good breaking strength in the spun yarn, just enough twist must be put in the roving to prevent its becoming strained in the spinning creel. It all depends on the nature of the stock. In case of poor stock an extra tooth of twist will make a great deal of difference in the breaking strength of the yarn.

(6) "If not too much trouble, let 'Wash' make a diagram of the flyer-lead and bobbin-lead frames, giving their diameters at different points along the cone."

If "T. A. A." was a practical speeder man he would not ask such a question, and this is the reason why. All practical speeder men will admit that on a pair of speeders geared exactly the same, the same rack gear will not give the same tension. Why is this so? It may be in the cone belt; it may be due to resistance offered by the carriage owing to dirty bobbin gears or tight spindles, or it may be due to the slight difference in the outline of the cones. Now with this in mind, how can it be possible for any one to give a diagram of the intermediate speeds when the hank roving, type of flyer, nature of stock, speed, etc., is not given.

"Wash" never claimed that the flyer-lead frame would improve a defective strand, but he does claim that the flyer-lead will not stretch the strand of roving delivered from the drawing rolls as does the bobbin-lead.

"T. A. A." terminates his article by stating: "I want to see 'Wash' make his flyer-lead frame take out some of the defects mentioned."

The difference between the flyer-lead and bobbin-lead follows: Owing to the bobbin leading the flyer, it creates unequal conditions which I have continually pointed out in these columns, while on the other hand, the flyer-lead

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WASH (R. I.)

Overcoming Yarn Weight Variation.

EDITOR COTTON:

Replying to the letter from "Contributor No. 1034" published in the February issue of COTTON, will say that our friend has not given us a great deal of information about his mill, but after reading and re-reading, I draw the conclusion that he is the superintendent of a mill equipped with machinery that is not of the latest design, and surely it is a small mill, for if the output were very large he would hardly find customers very long for the kind of yarn he says he is making.

Now our friend has already said he needs a good humidifier system. Of course he does, but I am not going to reply to his letter by telling him to get one by all means, or to buy any other machinery, because he says that he must run this race with the old "plug" that he now has. Of course, if he had his new "Racer" he wouldn't be having all this trouble, but a man's job is more than just signing requisitions for new machinery or supplies; he must at times do the impossible.

Assuming that he has six ends up on the drawing, he has a doubling of 1152, which is very small for making an even yarn. (The only trouble he speaks of is variation in weights.) Now let's go down to the picker room, roll up our sleeves and begin a search for the trouble. Remember this—there are no "just happen-sos" in a cotton mill; whatever the result obtained, there is a cause for it somewhere. With the aforementioned doubling, he cannot afford to take chances on anything that will tend to lighten or heavy the stock, even from the very beginning.

If he wants even yarn, he should make that breaker lap just as near the same weight, yard for yard, as can be. A good even feed to the breaker beater is essential. This means that aprons should be in good shape and tight enough not to slip. We will not discuss beater speeds, although a great many beaters are run too fast. Did he say four laps on the table? All right, let's run four, and not three. I am not interested in what the finisher lap weighs, but whatever it is, they should weigh that. If the finisher man can't hold them to a variation of one pound (one half pound each way), then he should look after the evener motions and the fans, dress the belts, and come on out in the card room.

Whatever the setting may be, it is very important that they should be the same on every card. The card *section* is not a machine, but every carding engine is a complete machine within itself as far as carding is concerned, and demands its own adjustments, independent of the one next to it. Whether there are ten cards or two hundred, one man should do all the setting. The first sliver after stripping weighs about one third less than before. It should run at least two minutes before being put up. To strip every other card and then go back over again is not a bad idea. If he creels the drawing all at one time, he should break out the splice after it goes to the can. Of course, if he has been looking for his trouble already, he is not running any singling in his drawing. The nearer to the yarn he gets, the nearer his doubling is spent. So if for any reason a part of his web comes down on the drawing it should be broken out. Too much tension on the slubbers will stretch the roving. The roving will stretch quite a bit before it breaks down. The last doubling is on the intermediates. I would be sure of a man that would not run a double or single. Also, the tension of the intermediates must be watched, and an oil used which will lubricate, especially where wear will affect the settings. Textile machinery deserves good oil, and not a cheap, watery, colored fluid that just cools things a bit.

Now if "Contributor No. 1034" does not like what I have to say about humidity, he can just throw all this in the wastebasket and go on with his troubles, but if he can't get over 37 relative humidity in the afternoon, would advise that he not run so much in the morning. There is too much difference. Not altogether from changing the weight with the water, but the stock will not run the same with a change that great. Maybe he has been running his humidity with the mill standing, in order to get it up, which should not be done. Show the uneven yarn to every operative and ask their cooperation in improving it, and where you don't get cooperation, get a new operative.

This will help some, but in going about be sure and do the hundred and one little things necessary to good running work, the things that no one can write and tell you about.

C. A. B. (GA.)

Cork Rolls and Over Drafting.

EDITOR COTTON:

In my November article I stated that I was hoping somebody would take up the subject of cork rolls and winding motions and that I was satisfied on finding a letter from "Wash" on same in the June number, but I must admit that as far as satisfaction with same is concerned, I was not at all satisfied with most of his remarks, and furthermore, after perusing the contents of "Wash's" letter in the March 1927 number, I find myself still more antagonistic to this writer's belief on the subject of cork rolls and winding motions.

However, I noticed in the fourth paragraph he advises me to get my dictionary to assure myself of the meaning of the word "over". Well, as I do not happen to have such a precious asset available, I will take it for granted that "over" means "above in measure."

In this same paragraph he makes a foolish statement by saying that the terms "over drafting" and "excessive drafting" have got me twisted, which of course is mere guess work and haphazard judgment.

I do not wish to deal with the question of cork rolls versus leather rolls to any great length, still I want "Wash" to know that we are making a 12 hank roving on Jack frames with the aid of leather covered rolls, and there is no over-drafting. It does not pay on our class of work.

It seems to me that if these cork rolls last as long as he claims they do they ought to be useful in some mill where quantity, not quality, is the motto for the production say of a 2 to 2.75 hank roving.

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A Hyatt representative can show you how to put the transmission equipment in your plant or mill on an efficient power, money and labor saving basis.

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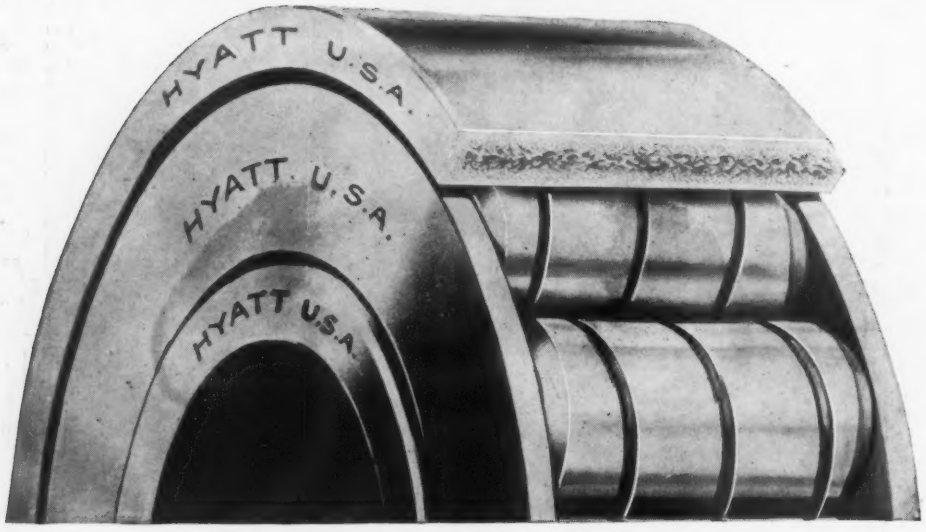
Hyatt—Line Shafts—9-27



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ROLLER BEARINGS

PRODUCT OF GENERAL MOTORS

"Wash" will undoubtedly have found that when he installed his cork rolls he had to attend to the top front rolls, setting them to fall forward more in order to prevent many hard ends. This proves that over drafting will occur with cork rolls if they are not given the proper attention.

Now "Wash" ought to take very particular notice of what W. C. Hames states in the second paragraph of his article on the "Methods and Costs of Roller Covering" when he tells us what one manager of a large spinning mill said when questioned as to what he considered the most important adjunct necessary to the production of good yarn. "As a result of my experience in spinning," he states, "I have for many years held the opinion that leather rollers play a greater part in the production of good or bad yarn than anything else in the mill. You cannot take too much care in keeping up the condition of the leather rollers, as you will be amply repaid in the production of good yarn."

That is where the cork roll adherents fail. Keep up the condition of leather rolls and retain that so much required cushion effect which I have previously mentioned and "above in measure" drafting will not trouble us any.

I notice in his letter "Wash" fails to state in this discussion the class of work, hank roving, etc., he is producing. This he should do as it gives a better picture of the conditions.

I should also like for "Wash" to take notice of the beginning of the 8th paragraph of W. C. Hames' article, as aforementioned, wherein he states, "Leather alone does not provide enough cushion —". Enough cushion, mind you, the essential asset. Where is the cushion effect obtained in cork rolls?

CONTRIBUTOR No. 4362.

Progressive Flat Setting.

EDITOR COTTON:

I noticed in the May number of COTTON a letter signed by "Contributor No. 559", in which he condemns the method of setting revolving card flats progressively, that is, setting the latter to the main cylinder gradually closer towards the front of the machine than at the back.

This is all wrong he says, decisively, because to obtain the cleanest work we must set the flats very close to a .005 gauge, but we must use a .007 and then make sure that the .005 just goes through. That strikes me as peculiar, to say the least of it, so I will endeavor to explain for the benefit of "Contributor No. 559" and others why I set revolving card flats years ago by the progressive idea, and my company, an English yarn mill, was producing 200s mule spun yarn then and is doing similar work today, and the combers did not do any excess amount of work other than was expected of them. However, when I read his statement about setting flats to .005 it occurred to me that this chap must have new machinery, and no doubt all these cards assembled on solid bases with not a trace of vibration around.

Of course all the wire on cylinders and flats will have to be in perfect condition and not a trace of a high flat on any card, and still, all the foregoing granted, he is all wrong in his settings and does not understand progressive settings on carding engines. Setting flats to a .005 gauge is taking an awful chance and I, with "C.C.(N.J.)" will say that grinding will be required more often and faced-up flats are almost certain to occur.

On considering the action of a carding engine we know that the few flats between the first, second and third setting points from the rear are bound to receive the greatest load of stock to deal with, and these flats becoming loaded with impurities are bound to allow finer trash to proceed onto the flats ahead between the third and last or fifth setting point, and if these points are set a little closer, there is always a better chance of catching the finer impurities. If these two latter setting points are set with the same gauge as the others, we lose that possible chance, and in carding we must take all the beneficial chances.

"Contributor No. 559" mentions the "feel" of the gauge and the sense of touch being unreliable. He is right there of course, but I think a deal of faulty setting is done by most fellows through the gauges they use, especially in setting the other organs of the card where leaf gauges are used. I have found that by using these gauges which are riveted together in four or six sizes there is always a danger of getting a wrong "feel" because when three or more gauges have to be held in the palm they are likely to destroy the true sense of touch which is in the finger tips, and also by using these gauges the one by which the particular organ is being set is likely to present a curved appearance through having to avoid something with the others held in the hand, and this of course conveys the wrong "feel" to the mind of the one who uses it. To overcome this I always advocate the use of single gauges, which have a piece of leather rivited on one end to insure perfect handling and can be used with the thumb and fingers, thereby giving better judgment.

This contributor in his letter seems to hit the card grinders pretty hard, and it seems to me that he must have had tough luck with his grinders, but on the other hand, if he will not give them a chance and some encouragement, how does he expect to create ambition. He states that he would not let a grinder set his flats so close, and now I am thinking that a grinder, mind you, I mean a card grinder as I know them, would not do it for him. And here, I would like to remind our friend that to make a grinder ambitious one has to confide in him, encourage him and discuss little carding problems with him from time to time and make him feel that he is one man in that room to be relied upon.

Most overseers treat their grinders too much like spare hands around the room instead of treating them as responsible men. This reader advises us that overseers should set the flats. I wonder how many of them have the time to do this job; except on occasions, and then only in some small mill. No sir, if one has a grinder who is backward at his setting this grinder should be shown how to do the job properly, and if he doesn't keep up with his business, providing he is treated right and given the time, my advice is to get rid of him.

We have eight grinders, besides the boss grinder, and they are kept busy by a splendid system of setting. They each have a section of 51 cards and by this system they all take down card-backs at the same time and set up one card per day until they have finished the whole section. Then screens are taken out, cleaned and overhauled and set up, one card every day. Then they set up two sets of flats per day on the cards they are grinding. This is done all the year around, besides polishing the cards from time to time, but these men are kept on their own job. These men have

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brains enough to think about settings because they are encouraged.

D.E.(R.I.)

Cone Belts and Their Work.

EDITOR COTTON:

Referring to the March issue of COTTON, in which "C.C.(N.J.)" makes some statements regarding cone belts, will say I should like to argue with this contributor in regard to some of his statements, and the first one is concerning his reference to a question asked by a contributor sometime ago—why is it that a cone belt wears out in one tenth the time as the driving belt, although its surface speed is only one tenth?

To begin with, look at the shape of the cones. Here we have a two-inch belt held between a pair of guards. This two-inch width of the cone has a different diameter at any point of the two inches of the surface the belt grips. One side is always trying to go faster than the other, and as one belt can go but one speed, it can easily be seen that one side of the belt is always slipping and the other always gaining. Thus both sides are always wearing. This also is why, when the belt breaks, the break is most always a diagonal and very seldom square across, as in most drives. A good many times when we have trouble getting the right tension, if we put on a new cone belt the tension will be okeh. When the belt wears narrow the cones are not gripped by a 2-inch belt, and the play of a narrow belt between the guards causes an uneven speed of the bobbin on the same layer of roving.

This short, narrow belt besides having a hard drive on the cones themselves, has to pull the hardest load on the fly frame, the rail. There never was an up-and-down motion that was exactly an easy drive, so imagine what this must be when one thinks of the average speeder where the bolsters have never been cleaned since the machines were erected. I would suggest having these cleaned and see if the belts do not last longer. We pull the spindles right out and pack the bolsters with waste and get a good cleaning on the slubbers and intermediates about every four months, intermediates about every eight months and jacks every year. On very fine work, that is 18- and 25-hank we try to do it oftener. The roving will be better, and run better as well as easing up on the cone belt.

As to the theory that cone belts break because they are run on so small a diameter, I cannot agree. How many small diameter pulleys are there on a card or a picker or any other part of the mill? I may be wrong, but I do not think that is the cause.

I should also like to argue about the special cone belts and their merits. I have tried about every kind that came along, but have always gone back to the good old two-inch standard leather belt. The biggest fault I found with the double belts was they split too easily; also, they are too stiff and do not bend to grip the cones enough. I have had all kinds of compositions, and the biggest lemon was some black stuff. Just as soon as a damp day would come they would wilt and break. In "dog days", in July, I have seen a dozen go in an hour. We have used many endless belts, some riveted and some sewed. They run fairly well, but long before they are worn out they stretch to such a point that they must be cut, so why spend good

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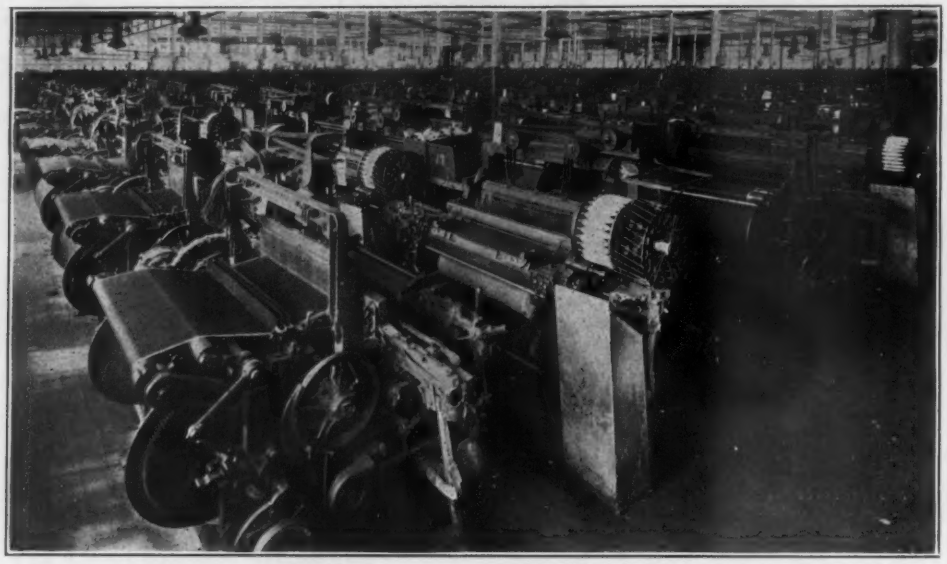

Partial View of Weave Shed of Industrial Cotton Mills, Rock Hill, S. C.

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Enough to indicate that the man who selected the equipment based his decision on more than snap judgment.

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money for them when a clamp must be inserted later? The best belt we ever used we made ourselves. We took the required length of two-inch single ply leather belting and pared down the ends and spliced it with glue. The carpenter rigged up a small clamp for us. Occasionally Saturday noon we raise the drum, put the belt around, cement it and put this clamp on. Monday morning we take off the clamp and lower the drum and that speeder is good for several years.

"C.C." says that he does not find that the belts wear faster on the bobbin lead than the flyer lead. I don't know about this, as I have never worked in a mill that had flyer lead frames.

I should like to see the diagram of the coneless fly frame the gentleman from Rhode Island was going to describe, the one I believe who started the agitation on the flyer lead frame.

It would be interesting to hear other discussions on this question, as I believe none of us get the service from a cone belt that we should.

CONTRIBUTOR NO. 739.

Information on Designing.

EDITOR COTTON:

On page 451, in the March issue of the COTTON, "Contributor No. 1041" was asking for information for constructing a stripe of warp satin weave with a spot of filling satin weave, the warp being of white yarn, and the filling being of colored yarn. In other words, he desired a white stripe with a colored spot in it. He is mainly concerned with the question, "how the white or the color is made to weave warp face and then filling face." As a fellow amateur designer, I wish to throw some light onto his inquiry.

In the first place, let us outline, or mark off the shape of the spot on a sheet of cross square paper, and then mark off the number of warp threads for the stripe. As indicated in the inquirer's diagram, the stripe is to be made of forty threads, of which fifteen are allowed for the spot. ("Contributor No. 1041" will please note that his diagram slightly disagrees with his wording in the diagram in respect to the number of warp threads.) Now fill up the space of the stripe to the left of the spot with five-harness warp satin weave and allow five harnesses for that purpose. Then continue filling in five-harness warp satin weave around the spot until you come to the middle thread of the spot. Similarly fill up the spot with five-harness filling satin weave until you come to the middle thread of the spot. For these eight threads of the spot assign eight harnesses. Thus, out of fourteen harnesses available for the stripe together with the spot, thirteen harnesses are assigned. In order to complete the rest of the spot and stripe, without the necessity of using more harnesses, we may design the right half symmetrical to the left half. The arrangement of harnesses is shown in Plate I and in Plate II. So long as the warp threads forming the spot are controlled by different harnesses other than those controlling the warp threads weaving continuous warp satin pattern, there is no difficulty to have the spot warp threads weave warp on the face first and then to weave warp under filling at any place we desire.

Just a little further, our inquirer will find that the design made according to the method described in the last

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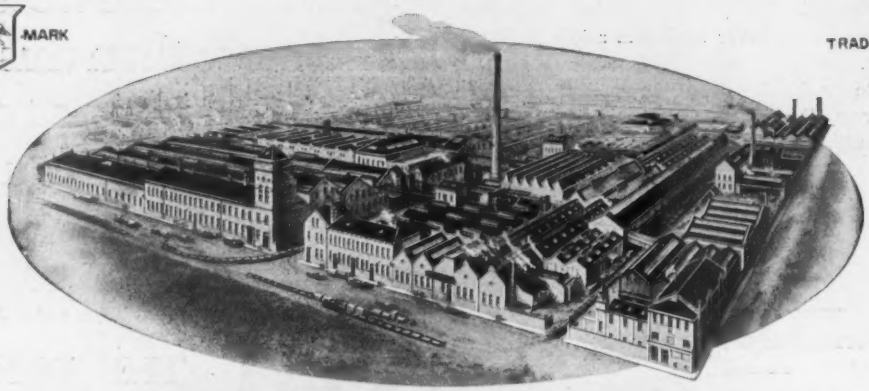

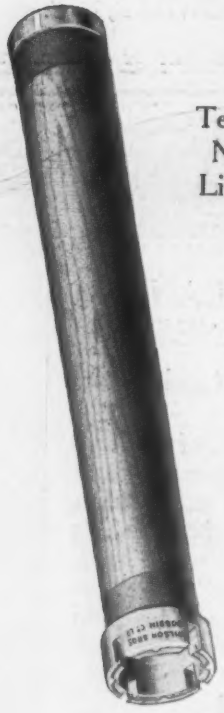

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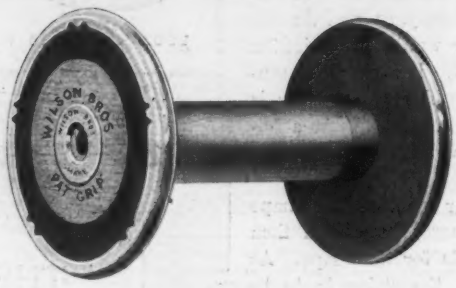

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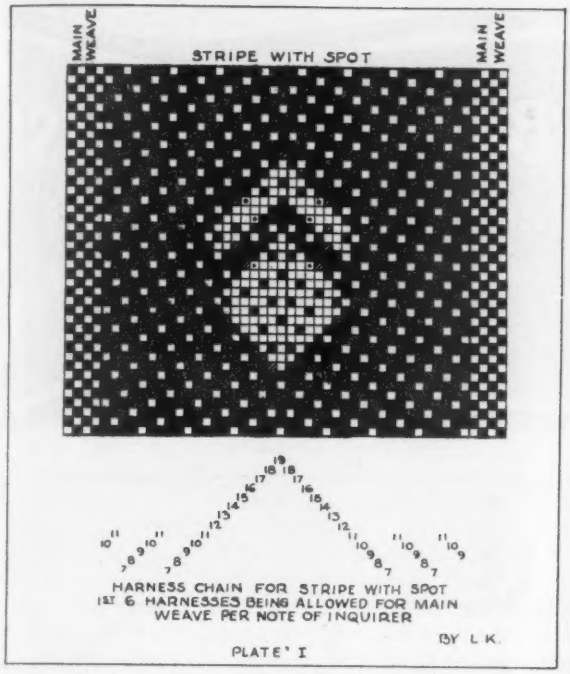
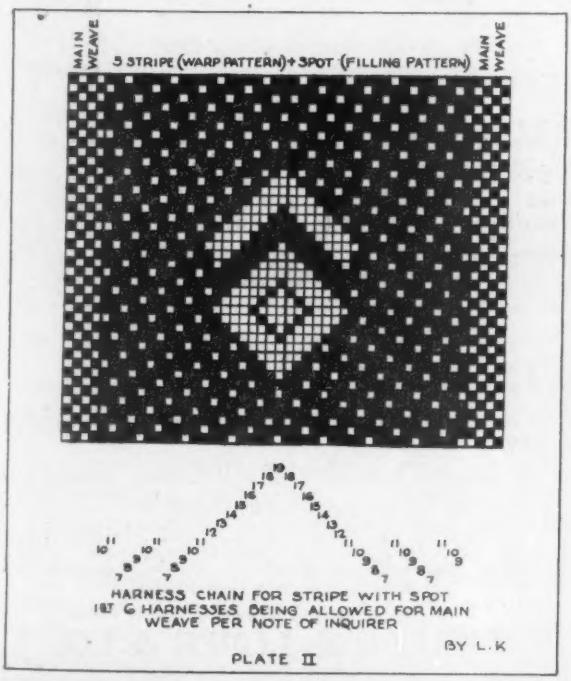

MAIN WEAVE
STRIPE WITH SPOT
MAIN WEAVE
HARNESS CHAIN FOR STRIPE WITH SPOT
1ST 6 HARNESSES BEING ALLOWED FOR MAIN WEAVE PER NOTE OF INQUIRER
BY L.K.
PLATE I

paragraph does not show the spot distinctly, for the filling stitches in the warp satin and the warp stitches in the filling satin interrupt the border of the spot. We may improve the design by eliminating the warp or filling stitches on the border of the spot. Now we obtain a design as shown in Plate I, and you can see that the color spot is better shown. In the figure, the cross-hatched spots represent the elimination of filling stitches in the warp satin weave right outside the border of the spot; the dots represent the elimination of warp stitches in the filling satin weave right inside the border of the spot. The elimination of warp or filling stitches in such places is done by


MAIN WEAVE
5 STRIPE (WARP PATTERN) + SPOT (FILLING PATTERN)
MAIN WEAVE
HARNESS CHAIN FOR STRIPE WITH SPOT
1ST 6 HARNESSES BEING ALLOWED FOR MAIN WEAVE PER NOTE OF INQUIRER
BY L.K.
PLATE II

Bulletins of Results
WASHBURN WOOD TOP ROLLS
—for—
SPINNING FRAMES

Number Yarn	100
Twist Square	3.90
Turns per inch	39
Staple	1½"
Kind	Combed Sak
Hank Roving used	9.3D
Draft	21.80
R.P.M. Spindle	9300
R.P.M. Front Roll	76
Weight Top Roll	1100 gr.
Average Size	100.2
Average Break	20

The above is a record of a test recently made using roving taken at random from a large fine goods mill.

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FALL RIVER, MASS. GREENVILLE, S. C.

merely extending the filling floats or warp floats by one space. This will not spoil the fabric.

As the spot is small and the filling floats are short, we may eliminate as many warp stitches as possible in the spot. The principle of satin weave is to have a parallel arrangement of yarns with just enough stitches to weave them into a fabric. So, there is no necessity to break a short float into two. In fact, the breaking of short floats will only spoil the satin pattern. The design in Plate II shows a cleaner, more lustrous spot, although the filling satin pattern is modified. L. K. (D. C.)

Selecting the Man for the Job.

EDITOR COTTON:

In regard to a question asked by a reader in the February issue, as to whether he should give the carding job to a textile student, who has only worked a few months, or to a fixer of several years experience, I should like to offer the following comment.

Does anyone think that the cotton business can be mastered in a few months time? Can you expect a young fellow of a few months experience to walk through a carding department and tell at a glance whether the picker is making a good lap. Can he be expected to know whether a card is doing its work properly? Whether cotton can be run successfully with certain feeds and speeds? What settings will best handle cotton of diverse characteristics? Can he be relied upon to tell in a few seconds as to whether he is using enough or too much twist in the roving on slubbers, intermediates, etc.? Does he know how to remedy trouble due to uneven drafting and faulty picking? Can he do the thousand other things that should be done in a well managed mill ? I hardly think so. It would be an injustice to the young man in question to put him in that position. He would be head and heels in trouble all the time. Also, he would have a room full of discontented help on his hands. I am writing this on the assumption that the overseer's job is his first.

As to the fixer, if he can also figure, on top of his experience, then he should be able to handle the job. Also if he has been there longest, then he should be given preference, all other things being equal.

Maybe I seem to be a bit pessimistic about the whole business, but I have always been in large mills, running a variety of work, necessitating frequent changes, and continual balancing of the room. Also, I have only worked in one mill, where you didn't have to smile, to camouflage the knowledge that you were among a crew of scalp collectors. A young fellow in the mill is handicapped, as a rule, by a nature that is too frank and open.

"However, your correspondent, being on the "ball grounds", is more able to judge the best course than any who will try to help him decide.

O. A. P. (MASS.)

EDITOR COTTON:

Selecting the man for the job is sometimes quite a puzzle. "Contributor No. 1033" seems to find it so.

It is always advisable to promote from the ranks if those seeking promotions are capable. The promoted man always works in harmony with, and does his work to please the man above him. However, I do not think that this contributor really wants either of these men, or he would know which one to hire, but to help clear up the muddle, we will discuss the matter, first taking the student. The student has been with him eight months, presumably a newly graduated man. Do you really think that any man in eight months from school is capable of holding down an overseer's berth? Do you think he has seen enough of the fortunes and misfortunes of others to gather knowledge and experience for himelf in that length of time? I hardly think so. I wouldn't hesitate to make a second hand out of him, but hardly an overseer.

Second, the fixer. He must be a pretty good fixer, or "Contributor 1033" would not consider him. Do either of these men hold the respect of the help, and would they continue to do so? Respect and confidence are the first things an overseer must get if he is to succeed.

I would suggest that "Contributor No. 1033" have a talk with these men, and let each prove why he should have the job. Surely this would do no harm, and it might help. I should like to ask if either man has applied for the job. A man who does not have backbone enough to ask for a job is not worth taking a chance on. I should give the fixer the slight edge on this, provided he can figure as well as fix. The student will probably make a first-class man, but eight months is pretty fast promotion.

I note the contributor asks "Old Timer" about this. One look at "Old Timer" gives one the impression that it took him slightly more than eight months to land his position.

After "Contributor No. 1033" has thought everything over thoroughly and is ready to decide, his mind will not deceive him. He will know who is the best man for the job.

J. C. (MASS.)

Oil Spraying and Cork Rolls.

EDITOR COTTON:

In the May issue of COTTON "O.T.(N.C.)" wants facts concerning oil spraying. I think I am qualified to write on this subject.

This contributor states in the latter part of the first paragraph, "There must be some difference with or without oil? Now what is it? And in whose favor?"

The chief fault to find with oil spraying is in the ingredients. The oil works to the top of the tank and varies the percentage.

In regard to the carding, it works wonderfully, and does all that is claimed for it. It does lay down the fly and dust.

Oil spraying adds a certain amount of weight to the sliver and yarn. This, added with the fly which should be removed at the card, presents to the ring frame a strand of roving with the proper weight, but with a certain per cent of fly and oil instead of all cotton fibers of a proper length.

My experience has been, that for a day or two the work will run fairly well, then a squall will come that will put the spinning room to the mat. Therefore, I favor running without oil spraying.

I want to thank "O.T." for his kind remarks concerning cork rolls. You know it is seldom I get any credit from the boys for what I try to convey them. That is my own fault, for I am a critic. However, the scheme works okeh, for after all our arguments, we are generally benefitted by them.

COTTON MILLS making Rayon fabrics are confronted with new problems of selling and financing. The Textile Banking Company, 50 Union Square, New York, specializes in Factoring such accounts and will be pleased to hear from manufacturers who desire to perfect new selling arrangements, or who are interested in Factoring services in connection with their own selling organizations.

Textile Banking Company

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PATENTED RAYON WARP-SIZING MACHINE NO. 81 TYPE M

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I must disagree with "O.T." in reference to what he states about moisture or oil affecting cork rolls. Water or oil will not affect those I am using.

WASH (R.I.)

Card Room Experiences.

EDITOR COTTON:

I should like to offer a few comments and opinions on the various points brought out in the carding and spinning discussion at Rocky Mount, as presented in the November, 1926, issue of COTTON. I also want to say that I find these various discussions of the greatest interest, and always get plenty of material for thought from them. They make COTTON an extremely interesting paper.

"Where is the most productive place for bad work on the card?" That, I consider, is a question very well asked, but I wonder if it can really be answered decisively in one sentence. What I mean is this, is it positively known whether dull wire on the cylinder will do more or less harm than can be caused by a licker-in in poor condition. Personally, I should say that a faulty licker-in would cause the most damage, but that is only an opinion and must be accepted as such.

To find the proper length of time to allow for the sliver to get back to normal weight after stripping, it is only necessary to weigh the sliver at intervals of one minute after stripping, until the sliver gets back to normal weight.

The question that each individual mill must settle for itself is whether it is most advantageous to wait until the sliver is back to normal weight and then re-work the waste made, or to run the sliver in after stripping and thus avoid making waste. It would appear that it is a universal law that every advantage must carry its parasite.

I want to commend both men who spoke out against the practice of licker-in grinding. They have eliminated one of the most absurd practices found in the mill today. They are overcoming neps in the yarn in a most sensible way, that is, by refusing to put them in.

There is good judgment shown regarding card drafts. If the draft is kept between 100 and 110, there isn't much chance of getting off the right road. I wouldn't advise anyone to exceed a draft of 120 and would recommend that draft only in case of necessity. Anything over that draft will prove injurious to the finished yarn.

It is a very good idea to remove the bars on the weight relieving motion on a Howard & Bullough drawing frame. I have been up against the same proposition, and the only way we could get the proper tension on the drawing was in the removal of those bars. The tension should never be allowed to run tight on a drawing frame, as the end is stretched, and uneven sliver is the inevitable result. A little sag should always be seen, but this is a very hard thing to watch, as constant vigilance is necessary, unless one has a room where the humidity can be kept pretty nearly normal at all times.

Sometime ago, after having spent quite an amount of time and patience in checking up on my calender roll gears and instructing the fixer as to just how I wanted the tension on the drawing, the superintendent, a new man by the way, sent orders to maintain a relative humidity of 80 per cent—*eighty per cent*—get that straight. Furthermore, we were told to keep it there. This included cards, combers, drawing, slubbers, intermediates and speeders.

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A true belt preservative that will greatly increase the life of every belt.

Dixon's Solid Belt Dressing does not harden, cut or clog the belt. Its high efficiency and economy are proved by many years' use in thousands of factories, machine shops and power plants.

Safe to apply with the belt running at full speed. A little applied at a regular interval is the best way to keep your belts in prime condition continuously.

Handy in size, 2 in. x 8 in. The weight is about 1 lb. Does not deteriorate in storage.

Write for Belt Dressing Circular No. 94-O.

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JERSEY CITY, NEW JERSEY
Established 1827

This order was so ridiculous that I decided not to take any action on it, figuring that it might pass over in time. I continued running my humidity at an average of 58 to 60 per cent, as I had been doing right along. I finally received a reminder that my humidity was not up to the required standard, so there was nothing left to do but follow directions.

Well, I pushed the humidity for all it was worth, but thank the Lord, we hadn't sufficient heads to raise it over 70 per cent. Then I was told to open up some windows and lower the temperature of the room, the idea being to bring up that humidity to the glorious 80 per cent. So open the windows I did (winter time) and down came the temperature, and also the humidity to about 44 per cent. Also, the chief engineer strolled along and wanted to know if the mill was expected to furnish heat for the whole town.

In the meantime a few good hands had packed up and disappeared in disgust. The poor hands hung on because they couldn't tell the difference anyway.

Tension and weights went plumb to the other place and back again. I had four fixers on the drawing and speeders and they couldn't change draft and tension gears fast enough. After the place got messed up right royally, orders came through to keep a "normal" amount of humidity, which meant "use your own judgment," so finally things got straightened out to the relief of all concerned.

However, if the fans and humidifiers are used with a grain of intelligence then no appreciable amount of trouble should be experienced in keeping the proper tension, especially on the drawing frames. The following relative humidity will give good results:

Cards, 52 per cent; drawing and combers, 55 per cent; slubbers, intermediates and roving, 60 per cent.

That settles it. Every time I think of the foregoing experience I get as mad as blazes. C. C. (N. J.)

Why Mote Knives Break.

EDITOR COTTON:

In the April issue of COTTON, page 561, I notice that "T. N." (Mass.)" would like to know why the mote knives break on cards.

In the first place, the lap presented to the action of the card has been, or should have been, cleaned and opened, although it has not been thoroughly freed from all impurities. On the other hand, if the lap is not opened, plucking takes place and this is what breaks the mote knives.

Many carders conceive the idea that when setting the feed plate to the licker-in, say to 7/1000, that the licker-in teeth would have a tendency to destroy the fibers, but such is not the case, and I wish to assure the readers that when the proper feed plate is used to suit the stock run, it is impossible to set the feed plate too close.

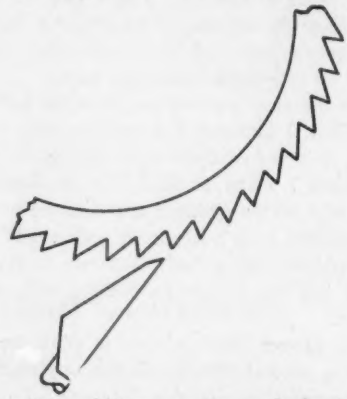
Of course, care should be taken that the points of the licker-in do not come into contact with the feed plate. Here lies the protection.

"T. N." should know that there is nothing but the stock that breaks the mote knives. The trouble is due either to a poorly opened lap or too much space between the feed plate and the licker-in. WASH (R. I.)

EDITOR COTTON:

In the April issue "T. N. (Mass.)" states he is having difficulty with mote-knives breaking. There are many things that will cause this. First, if they are not set to the proper angle, or if not close enough to the licker-in wire; and sometimes, the licker-in screen, if set too close to the licker-in, will cause a strain on the mote knives.

I will give the settings which work well for us on about 15/16-inch cotton, using from 13- to 16-ounce laps: Feed plate to licker-in (16-ounce lap), 17/1000; licker-in to cylinder, 7/1000; mote knives to licker-in, 5/1000, and as near the angle of the teeth of the licker-in wire as possible; licker-in screen edge next to feed plate, 1/16 inch; licker in screen edge next to cylinder, 1/32 inch. If "T. N." will have his grinders run the card about thirty minutes with stock after grinding, I think this will help him.



In a good many mills the old quadrant gauge is used to set the licker-in screen, but the best method I know is to have two pieces of tin about the length of the licker-in screen, one about 1/16 inch thick and the other 1/32 inch thick, each having a flange at one edge, so that when they are placed on the licker-in screen the flange will hook over the edge of the screen. The licker-in is then put back in its bearings, the screen is then set to the licker-in and not the quadrant. The licker-in is taken out after setting and the tins removed, and when the licker-in is replaced there will be no irregular settings. Then set the mote knives to the licker-in as shown in the accompanying sketch. This drawing is not very much, but it will illustrate very well. T. A. A. (S. C.)

Thornley Retires; Testimonial Planned.

Thomas Thornley, on August 31st, retired from his position as head of the Textile Department of Bolton Municipal Technical College, Bolton, England. Mr. Thornley has occupied a high position as a teacher of cotton spinning in England, and for many years has been one of the prominent personalities in textile instruction. He has also been a prolific writer on textile subjects, being the author of more than eleven books covering every phase of cotton spinning. It is the intention of numerous friends in Bolton and elsewhere to present him a cash testimonial in recognition of his services. The organizing committee requests that any of Mr. Thornley's former students and others desiring to be associated with the testimonial, communicate with T. A. Gledhill, treasurer, Technical College, Bridgeman Place, Bolton, England.

Taylor Takes on New Yarn Account.

The Yarns Corporation of America, 40 West 20th St., New York City, have appointed Walter C. Taylor Company, Kinney Building, Charlotte, N. C., as their southern representative, handling their rayon yarns.

Knitting Section

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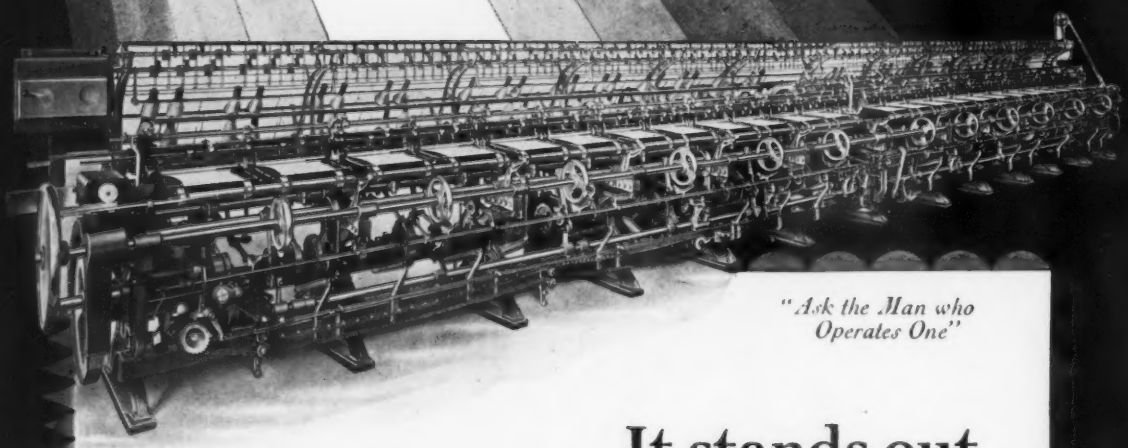

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The A B C of Dyeing

Securing Expected Result from Figured Formulae--Repairing Damaged Shades from Causes Known and unkown

BY NOEL D. WHITE.

PART FOUR.

In the preceding articles we have shown how to arrive at a formula for dyeing one stocking to match a given sample; then how to calculate the amount of dye stuff used in it and make a formula for dyeing 100 pounds of goods.

We now take our lot of goods, boiled off, washed, and whizzed as explained in the July number of COTTON, and put the lot in a dyeing machine. We fill up the machine with water, start it up and open the steam in the bath to heat it. With the drum of the machine rotating, the water should reach to just below the shaft of the drum. By the time the bath is boiling, if the steam is at the proper atmospheric pressure, the bath should reach about the center of the shaft.

While the water warms up we enter into the bath a pint of sulphonated oil, four ounces of Tetracarnit, and one pound of phosphate of soda if needed. (We have found that some direct colors go on the silk more than is needed on it, and to prevent that, when we use such dyes, we use phosphate of soda with them.) When the bath is about 120° F., we add the carefully weighed and dissolved dyestuff, and let the bath come to the boil gently for twenty minutes. Then we close the steam valve and add the Glauber's salt, from 5 per cent to 40 per cent according to the amount of dyestuff used; up to four ounces of dyestuff we use 5 pounds of salt; from four ounces to one pound of dye, 10 pounds is used; above one pound and up to two pounds we use 20 pounds of salt; and for over two pounds of dye we just study the requirements. For the darkest shade of Cordovan we never use more than 30 pounds of salt, for Navys and Blacks we use 40 pounds.

For light weight goods the salt can be put in all at one time. For heavy goods, like ribbed and tight knit tops, the salt should be entered in two portions, at a ten to fifteen minute interval, and boil between. Steam should be closed off when the last portion of salt is entered, and the goods worked in the cooling bath for 20 minutes.

For those dyers who prefer to bring up the color on the silk without any acid assistance, a sample can be taken out for matching now. It is obvious that in that case the trial sample must be dyed also without any acid in the bath. It is not my object here to advise anyone to use my method in preference to others, but to show how it is done successfully with our way of working.

After twenty minutes and with the bath standing at about 160 degrees F., we add from 2 to 4 per cent of acetic acid—again here we study the requirements. As the acetic acid is used to bring up the color on the silk and as some dyes exhaust more readily than others, on our first attempt with a new shade we use the smaller amount, 32 ounces; then if that does not suffice, the silk not being sufficiently colored and the bath still showing that it is not exhausted, we add 8 ounces of acid at a time until the exhaustion is complete before we add any more dyestuff. Also, we watch the color on the cotton. If it appears that the shade gets too weak on the cotton, adding acid will not help. In this case the original amount of color was not sufficient and we must add some direct dyes for the cotton.

We make it a point to dye the cotton up to shade first, then bring the silk up to match it, that being the easiest way. We do that in a fresh bath, adding the dissolved direct color as at the beginning and dyeing at a temperature of 150 degrees F., that being the temperature at which cotton dyes best.

When the cotton is dyed to a good match and a little darker, we proceed to match the silk either by putting acid in that second bath, or in the finishing wash if not much color is necessary for the silk.

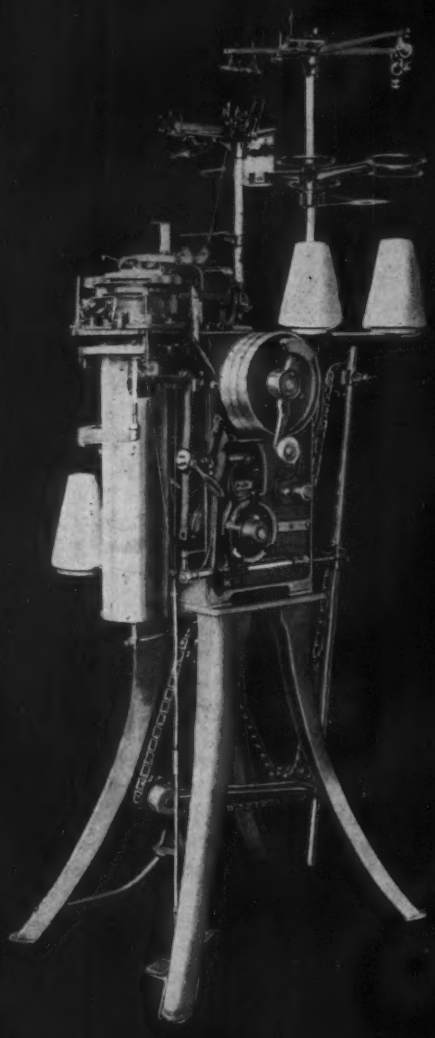
Taking advantage of the experience with our first lot, the next batch of the same shade should be much easier to get the first time we try, and usually it is. If we make any additions of colors to the second batch, and they are properly recorded in the original formula, subsequent lots should come out correctly every time.

But as a formula for one stocking, even with the most exact calculations, very seldom checks up correctly on a bath of 100 pounds, so it is with dyeing batch after batch with the same formula. For some reason or other no two batches come out alike. If it was so easy, like measuring off so many feet of lumber or counting so many bricks, many dyers would find themselves out of the work and the fireman could take care of the dyehouse. Sometimes there is a reason why the lot fails to come out a good match, some accident might occur and then it is that a skillful and well trained dyer acquits himself with credit.

Maybe a dye was left out of the combination; that, naturally, would make the shade different; or maybe the worker coming from the drug room with his colors in solution in a pail has collided with a truck or a barrel while on his way to the machine, and spilled part of the contents on the floor, and he continued on his way and put what was left in the machine heedless of the fact that his lot was going to be a bad job. What does he care? Of course, a worker of that kind has no place in a dyehouse, but there are such, for it happened where I was working a number of times. Now our helpers are carefully trained and made to learn that it saves time and worry to report any mishaps of that kind. However, it takes patience and kindness to train helpers that way.

Or, it may be the man in charge of a machine has gone off to argue with a fellow worker, or to place a bet on his favorite baseball team, forgetting he has the steam open full force in a machine, and on his return he finds the bath has boiled over and a part of it has gone down the sewer. If he is a conscientious worker and knows his business, he reports the fact to the foreman or his assistant that the necesary repair to the bath may be made in time. If he is not, he simply adds water to the bath to cover up his negligence and lets the dyer worry over the outcome.

Sometimes it happens that there are too many machines drawing steam at the same time, or that the steam is low in pressure and instead of boiling in ten or fifteen minutes it takes half an hour or longer, with the consequent accu-



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mulation of condensed steam entering increasing the volume of the bath, making it reach the top and overflowing, reducing the strength of the bath and diminishing the depth of the shade on the goods.

Any of these things are avoidable, but never-the-less are things that occur in any dyehouse and it is up to the dyer to watch constantly. When they do occur he has to know how to mend the damage and to produce uniform colors and shades regardless of what happens.

Taking the first case mentioned, a dye was left out of the combination—of course, that is easily seen on the goods. When the dyer goes over the formula he sees at a glance what is missing. If it is a silk dye that was left out, the mistake is easily corrected in the same bath, the dyestuff missing is weighed out, dissolved in hot water, and added in small portions to the bath. Another boil to equalize the lot, and the shade is corrected in a short time.

If, however, it is a cotton dye that is missing, it is not so easily corrected. I have yet to find a direct color that will work evenly on the cotton when any addition is made in an exhausted bath. Someone may advise that if I had no acid in my bath I may add color with safety, but I know by experience that it is very hazardous. Our way is to make any additions in a fresh bath, entering the missing direct dyestuff well diluted as explained. With a good selection of silk colors, fast, as they should be for dyeing hosiery, the shade on the silk is disturbed very little at the temperature of 150 degrees to 160 degrees F., and the dyer may proceed to bring up his shade to a correct match for the cotton. If, at this point, the silk should need any touching up, it may be done in the finishing water with some such dye as Azo Yellow, Zafranine, Fast Red, Alphazurine, Acid Green, Wool Violet, etc., which work very level even when added to the cold baths or in the finishing water, providing they are well dissolved in hot water, strained and added slowly in the machine with the drum rotating towards the worker, taking the color under while it is poured in.

In the case of the man who spilled part of the dye solution on the way to the machine, if he does not put the rest in the bath, the easiest and safest way is to make up a new solution entirely, which would greatly please the dyestuff dealers as they sell so little dyestuffs on account of the prevailing fashion of colors; but if the worker has put the saved portion of the dyestuff solution in the machine and said nothing to the dyer about it, then the dyer is in for a lot of worry and can only fix the shade the best he can after he sees the results.

As in the case of the man who let his bath boil over, and filled up the vat with water, saying nothing to avoid a scolding, such men should be told that it is much better to advise the dyer of any accident that may happen either through carelessness or neglect than to go ahead and let the dyer get gray haired over the outcome of such work.

When the contents of a vat has boiled over, it is easy to gauge the amount of the bath lost and if it occurred before the salt is entered, we may avoid trouble by adding one-third or one-fourth of all dyes entering the combination; and if the loss occurs during the boiling after the addition of the acid, then little damage was done to the cotton, it being already fully colored, and some addition to shade the silk is all that is necessary.

When the lot is off-shade on account of the steam being low, making the baths too long for good matching, this is an occurrence that is the most frequent in the dyehouse. The cotton in most cases is the biggest sufferer, some direct colors exhaust quite readily, others take a longer time. When diluted in too long a bath they lose strength and the shade is impaired in consequence, as most direct colors dye the silk more or less, and as the silk takes up the color, even in a long bath, when dyed with acid, it is easy to see that the silk may be a good match with the sample but the cotton is off-shade; this is the time that a good knowledge of how dyestuffs work comes in handy.

Some direct colors which leave the silk unstained should be in the stock room of every dyehouse for just such cases as this. To correct off-shades is a thing for the dyer to learn, and it can only be learned by experience, by testing the property of dyestuffs in the laboratory and applying the knowledge acquired to make the day's work easy and congenial. With an extensive knowledge of the property of the dyestuffs the dyer need not have any worry over the outcome of any accident that may occur. If a lot gets the dyer worried, it is best to let it lay until the next day; it may not look so bad then and be easier to fix than it appears at first.

In the next article uneven dyeing and spotted hosiery will be discussed.

Among the Knitting Mills.

Carmichael Hosiery Mills, McDonough, Ga., have been organized by H. B. Carmichael, proprietor. Ten Standard H machines, three loopers and one sewing machine are included in the initial equipment. D. A. Hood is superintendent.

The International Label and Card Co., Inc., have taken over the knitting mill of the F. Y. Kitzmiller & Sons Co. at Rogersville, Tenn. It will be converted into other manufacturing, though the company plans later to develop a knitting industry to utilize the machinery purchased with the plant.

Construction work on the No. 2 plant of the Rome Hosiery Mills, Rome, Ga., announced last month, is progressing.

Wyrick Hosiery Mills, Mebane, N. C., have been incorporated by G. C. Wyrick, R. F. Warren, S. G. Morgan and others.

C. F. Harvey, of Kinston, N. C., has purchased the properties of the Kinston Knitting Company at Kinston.

An extensive expansion program is under way at the Reliance Hosiery Mills, Shamokin, Pa.

Vaughan Knitting Company, Pottstown, Pa., is building a two-story and basement structure, 60x120, to cost $50,000, as an addition to the plant.

New machinery is being installed at the Hand Knit Hosiery Company, Sheboygan, Wis.

Julius Kayser Company is installing additional full-fashioned equipment at its Sherbrooke, Quebec, Canada, plant.

Chipman-Burrows Hosiery Company, East Flat Rock, N. C., has established a branch plant at Dana, N. C., at a cost of approximately $30,000.

Fisher Knitting Mills, Hazleton, Pa., have been organized by Oliver L. Fisher and others. Women's rayon underwear will be manufactured.

It is rumored that North Georgia is to have another Pennsylvania mill.

Perfect Split-Foot Product with Pointed Heel Reinforcement

There is constant satisfaction in a knitting machine which produces perfect work. You can buy our Split-Foot Pointed Heel machine with the full confidence that it will knit automatically a perfectly tapered reinforced heel, without leaving any unsightly fringe, or trimmed, or ragged edges resulting from the usual floating yarns—a product of beauty and endurance exactly as shown in the above cut.

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Problems in Knitted Texture

BY WILLIAM DAVIS, M. A.

A number of examples of knitted texture problems based on particulars which occur in practice might be worked out to advantage in connection with the article in August COTTON. Taking the systems of gauging machines, it is often required to transfer from one system to another, or it may be necessary to find the number of needles in a given width and so on.

Example 1. Calculate the gauge in Cotton's patent system of fabrics having 15 needles per inch, 26 needles per inch and 18 needles per inch.

In this case the gauge number is taken as solid, that is, unless otherwise stated, all leads in the machine are assumed to have two needles. The gauge being the number of two-needle leads in three inches, the given numbers are in turn multiplied by three to obtain the needles on three inches and afterwards divided by two to obtain the gauge number. This is equivalent to adding 50 per cent to the needles per inch. Thus for 15 needles per inch we add $7\frac{1}{2} = 22\frac{1}{2}$ gauge; for 26 needles per inch add 13 = 39 gauge; and for 18 needles per inch add 9 = 27 gauge.

Example 2. Find the number of needles per inch in a 24 gauge split frame, 44 gauge solid and a 28 gauge 3-needle frame.

A 24 gauge split frame has 24 needles in three inches and as there is only one needle per lead this gives 8 needles per inch.

The 44 gauge solid frame has $44 \times 2 = 88$ needles on three inches = $29\frac{1}{3}$ needles per inch.

The 28 gauge, 3 needle frame will have 3 needles in each lead, that is $28 \times 3 =$ needles on 3 inches, so that there will be 28 needles per inch.

The split and 3-needle frames, however, are seldom met with at the present day, as manufacturers are getting into the habit of calculating all gauges on the number of needles per inch or on the leads of two needles each in three inches. If a gauging system is troublesome also, they have a very decided way of displacing it by the simplest terms of needles per inch, which everyone understands.

Example 3. Find the number of leads in 24 inches of needles in the 30 gauge Cottons' patent frame.

$\frac{30 \times 2}{3} = 20$ needles or 10 leads per inch $= 10 \times 24 = 240$ leads in the width. This has often to be ascertained in order that the fabric be run on to its width in the center of the frame, leaving an equal distance from each edge. Knowing the total leads in the width of the frame and the number of leads required, it is an easy matter to arrange the running-on so that the web is located the same distance from each selvage.

Example 4. Find the total number of needles required for a frame having 8 needles per inch in the circumference, with a diameter of 19 inches.

$19 \times 3\,1/7 =$ circumference $\times 8 = 478$ needles.

Example 5. Given 1100 needles in a machine 22 inches in diameter, find the needles per inch.

The circumference $= 22 \times 3\,1/7$. Then $\frac{1100}{22 \times 3\,1/7} =$ 15.8 needles per inch.

Example 6. Calculate the number of needles per inch in a frame $3\frac{3}{4}$ inches in diameter with 260 needles in the circumference.

As $3\frac{3}{4} \times 3\,1/7 =$ inches in circumference, then

$\frac{260}{3\frac{3}{4} \times 3\,1/7} = 22$ needles per inch.

Example 7. Given a fabric with 14 wales and 20 courses per inch as standard, find the courses per inch for (a) 12 wales per inch and (b) 17 wales per inch to preserve the equilibrium of structure.

According to the rule given in the August number, wales $\times$ courses = constant for similar textures. So $14 \times 20 = 280$ as the basis. For (a) 12 courses per inch, $280 \div 12 = 23.3$ courses per inch; and (b) $280 \div 17 = 10.6$ courses per inch.

Example 8. Given a fabric standard with 18 wales and 26 courses per inch, find the alteration in wales per inch to preserve a similar equilibrium of structure for (a) 24 courses per inch and (b) 30 courses per inch.

The product of wales into courses in this texture is $26 \times 18 = 468$, and for (a) $468 \div 24 = 19.5$ wales per inch; and (b) $468 \div 30 = 15.6$ wales.

A number of calculations are also possible on the basis of the formula $G = k\sqrt{C}$, where gauge = the needles per inch, and C the worsted counts in single yarn. These explanations are important as all frames have to be transferred to the equivalent needles per inch and all counts stand in the worsted denomination before the rule can operate.

Given a constant of 3.2 for a given texture on automatic hose machines, calculate a suitable yarn for a 240 needle machine, $3\frac{3}{4}$ inches diameter. $240 \div (3\frac{3}{4} \times 3\,1/7) = 20.3$ needles per inch. By the formula $20.3 = 3.2\sqrt{C}$. $20.3 \div 3.2 = 6.34 = \sqrt{C} = 40.19$s worsted counts.

Example 9. Find a suitable gauge for 8s cotton counts and 16s worsted counts on the Cotton's patent frame with a constant of 4.2.

The formula $G = k\sqrt{C}$ is based on the worsted counts so that 8s cotton will require to be transferred to worsted thus $\frac{8 \times 840}{560} = 12$s worsted. $G = 4.2\sqrt{12} = 4.2 \times 3.5 = 14.7$ needles per inch, or nearly equivalent to 21 gauge Cotton's patent.

For the 16s worsted: $G = 4.2\sqrt{16} = 4.2 \times 4 = 16.8$ needles per inch = 25.2 gauge frame.

Example 10. Find the gauge of an automatic hose machine, $3\frac{3}{4}$ inches in diameter, suitable for working a 20s worsted yarn size. Constant = 3.2.

$G = 3.2\sqrt{20} = 3.2 \times 4.47 = 14.3$ needles per inch. $14.3 \times 3\frac{3}{4} \times 3\,1/7 =$ a 168 needle machine.

Example 11. Calculate a suitable yarn for a Terrot type of machine, 26 gauge fein, if the constant is 4.

From the table 26 gauge fein = 20 needles per inch. $20 = 4\sqrt{\text{counts}}$. $5 = \sqrt{\text{counts}} = 25$s worsted single.

Example 12. Find the constant in a machine where 16s worsted thread is worked satisfactorily on a machine with

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18 needles per inch.

As $18 = k\sqrt{12} = \frac{18}{\sqrt{16}}$, then $k = 4.5$, the constant.

When it is required to transfer from one gauge to another and it is essential to obtain a fabric exactly similar in construction and texture, then the change from one to another takes place inversely according to the square root of the counts and the constant does not require to come into the reckoning at all.

Example 13. If 7s worsted yarn is found to be suitable for a machine with 8 needles per inch, find a yarn to make a similar texture with 12 needles per inch.

The variation takes place inversely according to the square root of the counts, thus: 8 : 12 :: $\sqrt{7}$ or $\frac{12\times\sqrt{7}}{8}$

Squaring the expression gives the following: $\frac{12\times12\times7}{8\times8}$ = 15.7 counts.

Example 14. If 20s counts are suitable for a machine with 13 needles per inch, find the setting for a similar fabric in 14s yarn.

As the $\sqrt{20} : \sqrt{14} :: 13 : X$.

$X = \frac{14\times13\times13}{20} = 118.3$, the square root of which is 11s approximately.

Example 15. If 9s counts is suitable for a machine with 9 needles per inch, find the setting for 25s and 7½s counts respectively.

As $\sqrt{9} : \sqrt{25} :: 9$: to the setting desired, or $\frac{5\times9}{3}$ = 15 needles per inch for 25s counts.

$\sqrt{9} : \sqrt{7\frac{1}{2}} :: 9$ or $\frac{\sqrt{7.5}\times9}{\sqrt{9}}$. By squaring the whole expression we obtain $\frac{7.5\times9\times9}{9} = 67.5$, of which the square root is taken as 8.2 needles per inch.

Example 16. If 16s yarn is required to make a suitable fabric on a 24 gauge frame, find the counts for a similar texture on a 30 gauge frame.

The size of the new yarn will be inversely proportional to the square root of the given counts thus: 24 : 30 :: $\sqrt{16}$: N.

$N = \frac{30\times4}{24} = 5$s as the square root of the new counts = 25s.

Example 17. If 9s cotton yarn is regarded as suitable for a 24 gauge frame, find the counts in worsted which will give a similar texture in 18 gauge and 34 gauge respectively.

In this case the method is to find the counts in cotton first by means of the rule and afterwards transfer the cotton counts into worsted. Thus 24 : 18 :: $\sqrt{9}$: the answer.

$\frac{18\times3}{24} = 9/4 = 2.25$ which squared = 5s, or $\frac{18\times18\times9}{24\times24} = 5$s approximately. Transferring this into worsted $\frac{5\times840}{560} = 7\frac{1}{2}$s worsted.

For 34 gauge the formula is set out thus: 24 : 34 :: $\sqrt{9}$: N.

$N = \frac{34\times\sqrt{9}}{24} = \frac{34\times34\times9}{24\times24} = 18$s cotton approximately:

$\frac{18\times840}{560} = 27$s worsted counts.

Most of the foregoing calculations relate to the fabric as it is worked on the needles of the machine but it is very noticeable that the knitted fabric contracts immediately the course of loops leaves the needles of the machine. As the fabric proceeds downwards to the take-up rollers there is a certain elongation of the loops and a strain is applied in drawing the fabric away from the needles. When this longitudinal strain is released there is a contraction as the fabric assumes its natural and comfortable position at which it will remain during its period of wear if the fabric has been correctly built as regards gauge and texture.

Where the stitch is of the fuller cardigan or half-cardigan, where the intersections of the stitch are reduced owing to the floating nature of the loop, a greater amount of yarn can be accommodated. This has the effect of making the contraction from the needles very slight in those two varieties of stitch, in fact in the case of the full cardigan stitch the fabric may actually show at a greater width when it leaves the frame. This feature is made effective use of in the important class of articles known as the ribbed vest trade. In this case the article alternates in shape from a constricted portion which is destined to grip the waist of the wearer, along with a fuller portion which is intended for the bust portion. By having the ordinary plain rib stitch in the lower portion, the width is contracted as desired, but by making the bust in the fuller cardigan or half cardigan stitch the fabric of itself goes to width without any attempt at fashioning, which is an enormous advantage.

This is a matter of more than theoretical interest because of the necessity of obtaining full particulars for the reproduction of knitted fabrics and garments when finished. When examining a fabric in this state, one of the first desiderata is the gauge on which the texture has been worked. One measures the number of wales per inch and also the number of courses, but an allowance has to be made which will give us the number of needles per inch in the machine on which it has been worked along with the probable number of courses per inch. The estimation of the amount of shrinkage undergone is always a difficult problem, but a few suggestions may be made as to the general behavior. Plain goods made on the flat machine of the Cotton's patent type or the flat knitting machine, usually contract about 10 to 15 per cent in width on leaving the needles of the machine. In the circular frame the contraction is always greater and a fabric made on the 19-inch diameter machine is expected to lie 19 inches wide in the double fabric when finished. The Cotton's patent fabric, in addition to the fabric contraction mentioned, will have a further contraction of 10 to 15 per cent due to fulling if made from woolen material.

Rib fabrics in general show a larger contraction than plain ones except those produced on the flat machine in

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the half and full cardigan stitch. In the ordinary rib flat knitting machine the contraction will be about 10 per cent, but in the half cardigan it may only be 5 per cent while types of full cardigan are met with which show a slight increase in width on leaving the needles. Plain rib may show as much as 50 per cent contraction in width when finished, and plain circular fabric about 36 per cent.

Example 18. Given a fabric with 20 wales and 28 courses per inch, which has contracted 18 per cent in width and 12 per cent in length, find the wales and courses per inch in the frame.

With 20 wales per inch, this condition corresponds to the fact that its former state was 100, but this has shrunk to 80, its present condition, so that the wales per inch in the frame are given as follows:

$$\frac{20 \times 80}{100} = 16 \text{ wales per inch, which in the Cotton's}$$

patent will give 24 gauge.

Similarly, in the length the contraction is given as 12 per cent so that 100 — 12 = 88 which is the number corresponding to the present condition of the fabric. $\frac{28 \times 88}{100}$ = 24.6 courses per inch in the frame.

Example 19. A fabric has shrunk 20 per cent in the width and 15 per cent in length; it has 26 wales and 35 courses per inch finished. Find the number of needles or wales per inch in the frame and the courses. 26 wales represents 100 — 20 = 80 as its present condition so that the wales or needles per inch on the frame are given thus:

$$\frac{26 \times 80}{100} = 20.8 \text{ wales or needles per inch} = 30 \text{ gauge.}$$

For the courses per inch 100 — 15 = 85 and $\frac{35 \times 85}{100}$ = 30 courses per inch.

Example 20. Fabric worked in a 19 inch diameter frame gives 19 inches finished double in the fabric, estimate the contraction percentage. In the machine 19 inch diameter gives 19 × 3 1/7 = 60 inches of needles approximately. The finished fabric is 19 inches in the double = 38 inches, so that 60 inches of width contracts to 38 inches which means that 60 — 38 = 22 inches that are lost on 60. Find the percentage thus:

$$\frac{22 \times 100}{60} = 36.6 \text{ per cent contraction.}$$

Example 21. Find the percentage of contraction which occurs on a rib frame which has 15 inches diameter of needles and gives a fabric 12 inches wide on the double when out of the frame and 11 inches double after scouring and finishing.

A 15-inch diameter of needles = 15 × 3 1/7 = 47.1 inches. 12 inches of fabric on the double = 24 inches flat so that 47.1 shrinks to 24 inches on the frame. 47.1 — 24 = 23.1 loss on 47.1. How much will the loss be on 100?

$$\frac{23.1 \times 100}{47.1} = 49 \text{ per cent.}$$

If the frame contraction and that of finishing be taken together, the flat width is 22 inches, so that 47.1 — 22 = 25.1 loss on 47.1. What will this give on 100?

$$\frac{25.1 \times 100}{47.1} = 53.3 \text{ per cent combined contraction.}$$

New Novelty Numbers.

Knit goods manufacturers and sellers in the metropolitan area are planning to bring out many new novelties dur- "Sweater Week" to be staged the week of September 26 all over the country, at least, so far as the National Association of Knitted Outerwear and Knit Goods Selling Agents' Association can influence the makers and sellers of their products. Plans have been made for extensive advertising, although numerous factors do not approve, but admit that the time would be right to feature sweaters as the schools and colleges are just reopening after their summer vacation and consumers in general are thinking of the cooler days with the cold nights, although the sun is very warm during the day.

In anticipation of this big event in the industry producers in the metropolitan area are planning many new numbers, particularly in novelties. There are many showing the complete "ensemble," bolero, kerchiefs, blazer and plaid sport coats and others in checks, plain weaves, stripes and some fancy orders. The mountain sets consisting of sweater, scarf and cap, bold in color, in dice checks of green and white, black and white and other striking contrasts has been included and, believed to be promising numbers, are being tried out at the present time. One of orange and brown was featured in the collection.

Knitted coats with clipped wool collar and cuffs in jacquard weaves, stripes and plaids were among those attracting considerable attention at the close, with gray, mauve and several tan and brown shades the favorites. It is believed by prominent factors that these coats will become more active for spring and summer of 1928, and several new models have been made for their 1928 collections.

Holiday and Palm Beach numbers feature the collection of underwear and hosiery. For instance, a rayon undergarment has been made by a large producer which has required two years' experiment with the rayon yarns before it was of the proper quality to put on the market.

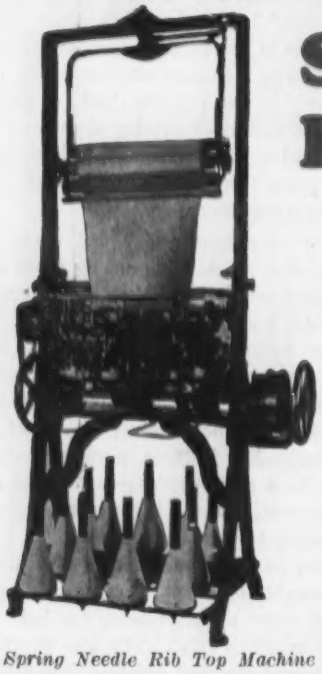
Another undergarment has been perfected to fill a need which has long been sought by the consumers. Many women have complained about the slips being too light in weight to wear without an extra skirt. The new garment is a union suit and shirt skirt attached which is close fitting and gives the needed fullness under the slip. It is believed that sets of this sort would make good holiday numbers and several producers are considering adding them to their lines and going to work immediately upon them.

Moka is one of the new shades of brown that is popular at the present time and many of knitted lines feature this color, particularly in hosiery and outerwear. It is believed that matching colors will be wanted in hosiery and while there are many light shades which have been prominent during the past month there are also several of the darker or street colors, matching outer apparel, that are finding favor at the moment.

"Knee Clox" are among those favored at the recent Exposition of the National Association of Hosiery and Underwear Manufacturers, held at the Waldorf Astoria, week of July 18th, where not only the finished product, but machinery was on display.

There may be splinters in the ladder of success but you don't notice them unless you're sliding down.

Cooper Spring Needle Rib Knitting Machinery



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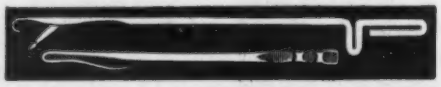

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Figuring Formulas for Hosiery Dyeing.

EDITOR COTTON:

I have been readnig "The A B C of Dyeing," by Noel D. White, which you are publishing in the Knitting Section of COTTON. The articles are very interesting and practical, but in the August issue installment, I find a point on which I must disagree, and without intending to be critical, I want to bring it out so as to get some discussion on it and possibly arrive at some definite method.

On page 1051, Mr. White, discussing the subject of figuring the formulas for different colors in dyeing hosiery, says that after the correct shade is obtained, it is only a case of arithmetic to arrive at a formula for 50, 100, or 200 pounds of goods. He gives his method for figuring the formula for 100 pounds of goods. His system is correct so far as it goes, but I notice he gives the answer in grams, and it is my opinion that it should be expressed in grains, since no one uses gram scales for weighing dyes for 100-pound batches. It is, therefore, necessary to take his gram figures and multiply them by 15.43 to get the answer in grains, which seems to be too long a method. For example, he finds he needs 36.288 grams of Direct Brown in his formula, which, multiplied by 15.43 gives 559.92 grains.

In his formula, for the shade he desires, he finds he wants:

Direct Brown	20 c.c.
Direct Red	1 c.c.
Azo Yellow	3 c.c.
Fast Red	2 c.c.
Grey for silk	5 c.c.

He says, "Taking the foregoing formula as an example for one stocking supposed to weigh 25 grams. If I used 20 c.c. = 20 mg. of color for 25 grams of goods for 100 pounds, or 45,360 grams, the problem is:

$$45{,}360 \div \frac{25}{.020} = 36.288 \text{ grams of Direct Brown, which is}$$

$$\frac{45{,}360 \times .020}{25} = 36.288 \text{ grams of Direct Brown.}$$

In my opinion, the formula most dyers use operates about like this:

$$\frac{20 \text{ mg}}{25 \text{ g}} \text{ or } \frac{.020 \text{ g}}{25 \text{ g}}\%. \quad \frac{.020}{25}\% \text{ of 7,000 grains per pound is 560 grains.}$$

The short method is:

$$\frac{200}{25} \times 70 = 560 \text{ grains.}$$

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packng and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Taking the Fast Red in his formula (2 c.c. or $\frac{.020}{25}\%$): 20 ÷ 25 = .8, and 70 × .8 = 56 grains. Now using his method of using grams and converting them into grains, since the 20 c.c. of Direct Brown = 36.288 grams, then 2 c.c. of Fast Red will equal 1/10th of that or 3.6288. Thus, 3.6288 × 15.43 = 55.992 grains, which shows that my method, giving 56 grains, is sufficiently close and accurate.

You can divide 200 by 25 and multiply by 70 in your head, or, if 20 c.c. works out 560 grains, then 1 c.c. = 1/20th, 2 c.c. = 1/10th, 5 c.c. = ¼th, etc., etc.

If Mr. White, or any other reader, feels I am in error in my method, I shall be glad to have it brought to my attention. I thought, however, that this might clear up the one point and make it more applicable in a practical way.

T. O. (N. C.)

Conditioning Silk Before Knitting.

EDITOR COTTON:

I note that "H. D. (N. C.)" is seeking information as to what method he might use to keep 3-thread silk in good condition after it is received at the mill so that it will run well on the seamless knitting machines even though he has to keep it in stock several days before use. My impression after reading his question as it appeared in the August number of COTTON is that at the present time the silk after being received from the throwster is placed out in the open, therefore allowing it to dry out, which causes the silk to run poorly when used on the knitting machine.

There are two ways whereby the silk after being received can have the moisture in it retained.

My suggestion is that one way to overcome the dryness of silk is to have a humidor cabinet built, either of wood or steel (steel preferred), which would be airtight. The size of the cabinet would be according to the amount of silk to be stored and on the bottom of the inside of the

cabinet a pan should be placed into which water should be poured. Holes should be drilled in the shelving so as to allow the moisture to circulate through the entire inside of the cabinet. The length of time it is necessary to keep the silk in the cabinet will depend upon how moist one might want the silk and also the atmospheric conditions that prevail at the time the silk is placed in the cabinet.

I mention a steel cabinet because there is now a manufacturer of steel equipment who is making a splendid cabinet for just such a purpose. This is far better than a wooden cabinet and is much cheaper in cost. If a wooden cabinet is to be made it is advisable to have it lined with a rust resisting metal, otherwise the desired results cannot be secured, because the wood would absorb considerable moisture and a longer period of time is needed in a wood-lined cabinet to secure the moisture required.

A cabinet six feet high, three feet wide and eighteen inches deep is usually considered an ideal size for general storage of silk. The pan at the bottom of the cabinet should cover the entire bottom and should be about four inches deep. Five shelves should be placed inside the cabinet, and this number will not cause an overcrowded condition and allow the moisture to circulate through the entire inside of the cabinet.

Sometimes one pan of water is not sufficient for a cabinet of the size mentioned . In such a case another pan can be placed in the center of the cabinet and usually this will take care of the silk at all times.

Another way to secure moisture in silk is to build a cabinet lined with rust resisting metal and have a steam pipe entering into the cabinet. The pipe should have a series of small holes drilled in it. This will allow live steam to enter into the inside of the cabinet and the moist steam will penetrate the silk. This is the best method one can use where considerable moisture in silk is needed or desired. The amount of moisture desired can be controlled by having the silk steamed for a long or short period of time. The long period giving more moisture and the short period giving less moisture. This size of a cabinet for steaming would again depend upon how much silk is to be stored. It is best to have two lines of steam pipes in a cabinet of this kind, as sometimes atmospheric conditions require more steam and an additional pipe will enable one to secure this.

Modern treatment of silk does not require a great deal of moisture and if silk is purchased that is treated with oils that hold moisture in the silk, an airtight cabinet is all that is required. I would suggest that this be looked into also, as perhaps the silk that is being purchased is not treated in any way, and through this considerable trouble is had in running the silk. A good throwster can treat silk so it will hold moisture for a period of time and also absorb the small amount of moisture it would receive from placing it in a cabinet containing only one pan of water.

There are some mills who are using a celluloid or glass jar holding one cone of silk on their knitting machines. These jars contain water in the bottom of the jar and have a covered top. This might also be a good method for "H. D." to use.

My experience has been that in most cases one must solve this problem for himself as to the best method to use, but the various ways I have suggested are the ones generally used, and as to the amount of moisture desired, it is necessary to experiment to see which gives the best results in any one particular mill. Climatic conditions have a great deal to do with moisture, and if local conditions are either a dry climate or a moist climate one must work accordingly. I am sure, however, that with a study of actual conditions of "H. D.'s" average climatic conditions and using either of the methods suggested, that his difficulties will be overcome. CONTRIBUTOR No. 2618.

EDITOR COTTON:

I have never found it necessary to provide any means of moistening or conditioning thrown silk for use on seamless knitting machines. In a recent issue, "H. D. (N. C.)" stated that he has shipments of silk yarn come in in cases for his daily requirements, and in standing in the mill or warehouse the yarn becomes dried out, and he wanted someone to describe a method for conditioning this silk. As I say, we have never found it necessary to treat our silk, if it is properly conditioned before throwing and properly wrapped in tissue or glassine paper after being coned.

Of course it is not advisable to carry too much stock in the mill, as the yarn naturally would have a tendency to dry out. I should say that not over one days' supply would be a satisfactory arrangement. The balance of the stock should be carried in storage or in a warehouse where there is no heat. The stock in the mills should remain wrapped in the glassine paper until it is necessary to place it on the machine.

If the silk is properly conditioned when being thrown, it will remain so for three or four weeks if it is properly wrapped and stored. If it is not properly conditioned in the throwing, it cannot be corrected or improved in the cone by conditioning after it is received at the mill. Of course a cabinet or humidor containing pans of water could be provided for the stock in the mill to keep it slightly moist, but we have not found this necessary for silk that is run dry on seamless machines. B .G. (N. C.)

EDITOR COTTON:

I notice that one of your readers recently told of his problem in having 3-thread silk on hand for several days after it reached the mill, so that it dried out and did not run properly on the knitting machines. He wanted someone to give him a method for conditioning the silk on the cone so that it would come off easily on the machine.

A very good and inexpensive arrangement for keeping silk in the proper condition prior to knitting is to board off a portion of a room to the required size, with shelves arranged so that the cones could be laid out. Then a steam pipe is fitted and turned on and regulated so that the humidity is about 80 per cent. If the mill has a yarn conditioning machine the exhaust steam from this could be blown into this room to advantage. It might even be necsary to place water on the floor.

The most important point in connection with a conditioning room of this kind is to have a proper circulation of air so that the air will not get stagnant and cause mildew.

We have such a conditioning room here built along these lines, and it has proven very satisfactory indeed.

CONTRIBUTOR No. 2617.

Weil, McKey & Company have announced the removal of their Boston office to 80 Federal Street, Chamber of Commerce Building, Boston.

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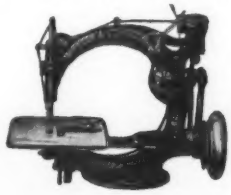
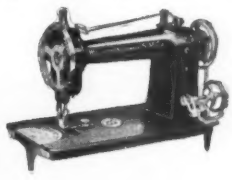
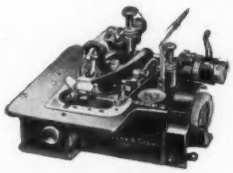


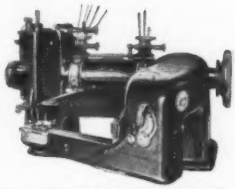
The CHAINSTITCH MACHINE with Registering Measuring Tension, Type 502-A, for bloomer headings and label sewing.



The LOCKSTITCH MACHINE, Type 10, for sewing on shields, attaching shoulder straps, etc.



The OVERLOCK SEAMING MACHINE, Type 401, for seams that lie flat. The OVERLOCK HEMMING MACHINE for concealed stitch hems.



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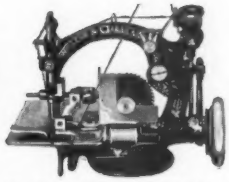
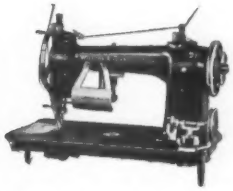


The SHELL-SCALLOPING MACHINE, Type 508-A, for scalloped edge effects.



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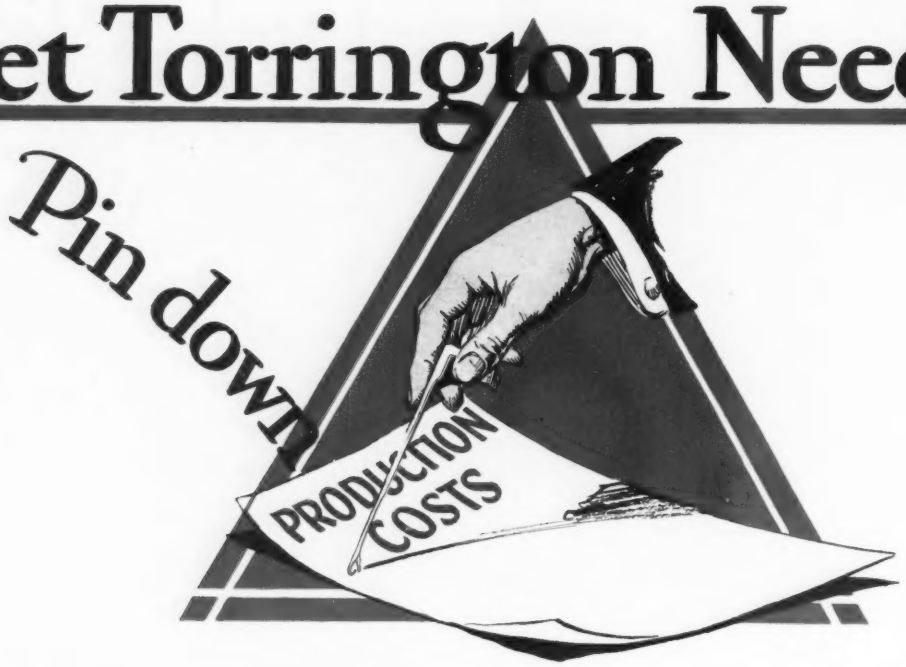

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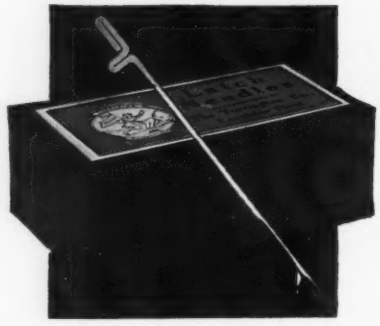

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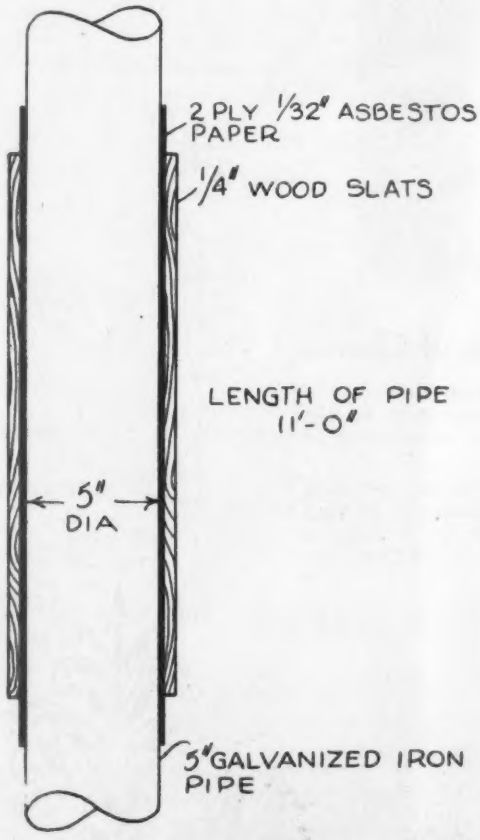
Overcoming Water Stains on Underwear Fabrics.

EDITOR COTTON:

In your March issue, on page 497, you published my question asking for remedies for water stains or shiny spots on drying knitted fabrics on the Utica Mill Novelty Company's pipe dryer. In this letter I brought out that we experienced these water stains in the fabric, noticeable when the cloth was passing from the dry pipe over the spreader to the take-up.

In later numbers you have printed several interesting replies to this question, which we appreciate. Some of them recommended that the dry pipes be insulated. We came to the same conclusion that this would help, and had our dry pipes overhauled, putting on a new layer of asbestos paper



between the outside slats and the metal pipes on the inside. This, I think, will be clearly understood by referring to the accompanying sketch which shows our method of insulating our dry pipes.

Later, we found that we could overcome a considerable amount of this trouble by extracting our cloth to the proper degree. We concluded that a great deal of this trouble which we have been experiencing was caused by not extracting the water from the cloth sufficiently, and since the time the cloth is extracted has been increased, we have had less and less of these water stains with which to contend.

I appreciate very much the assistance we received in this problem through the medium of "Knitting Kinks" in COTTON.

CONTRIBUTOR No. 1045.

Trouble With Uneven Stitches.

EDITOR COTTON:

On a 240-needle, 3½-inch Model K machine, what causes the short needles to knit a tighter stitch than the long needles? I would like to have advice on this through "Knitting Kinks."

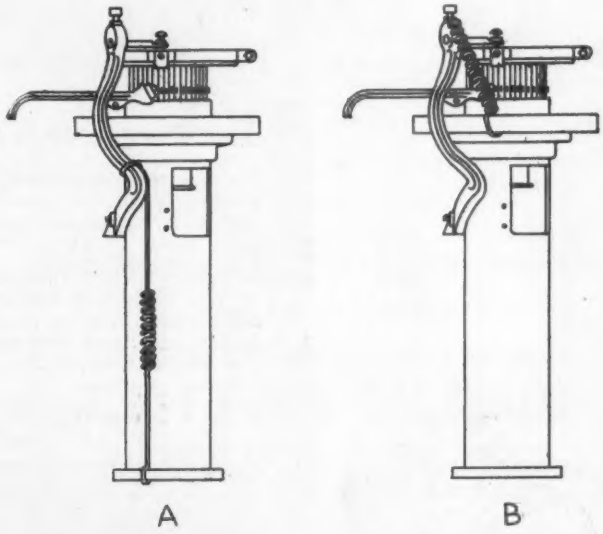
The machine was running all right until the heel yarn finger spring broke and caused a bad smash-up, after which the short needles began knitting tight. I had the cylinder taken out and the brass ring appears okeh, tight and even. We put in new sinkers and stitch cams and new needles.

I would be glad to get any information on the possible causes of this trouble. B. G. (CAL.)

Keeping the Work on Size.

EDITOR COTTON:

On page 303 of the January issue of COTTON you carried a letter from "T. C.. (Tenn.)" describing a method he has for keeping ladies' hose on the Model K machine on size. This consisted of a spring from the cylinder tube arm down to the screw-hole in the bracket at the bottom. "T. C." emphasized the point that while this will give additional pressure and "pull" on the head, it is most important that the machine be properly oiled at all times, so that the cylinder will work freely.



I heartily agree with him on this point, and his method of attaching the spring is all right. However, there are more ways than one to do most everything, and I am sending you a sketch which shows two ways I have done this also. Furthermore, I have applied this principle to the H H and other half-hose machines as well as to the Model K, which he mentions.

Both of the methods are self-explanatory. The one at *A* is similar to the one described by "T. C." except that I do not use the screws and the spring is shorter, being extended by two pieces of strong wire. The upper end is fastened around the cylinder tube arm, while the lower is bent in such a way as to hold against the cylinder tube bracket.

At *B* is another method. In this the spring is bent and hooked around the bed plate of the machine at the lower

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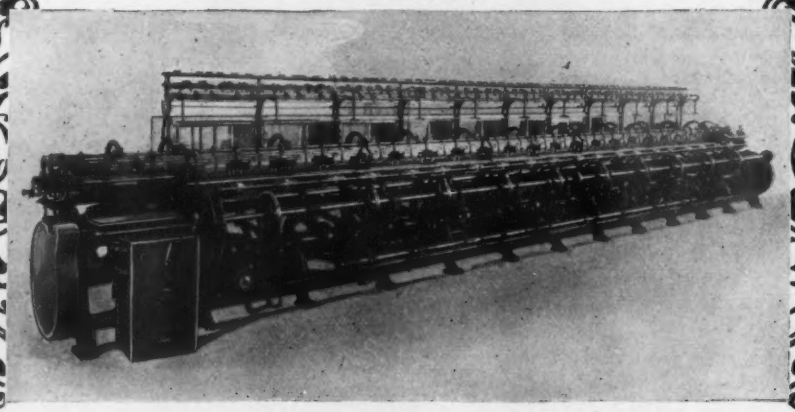


The READING
FULL-FASHIONED KNITTING MACHINE

end, and around the screw in the top of the cylinder tube arm at the upper end.

All these things help along, and I would like to see more "kinks" like this described in "Knitting Kinks."

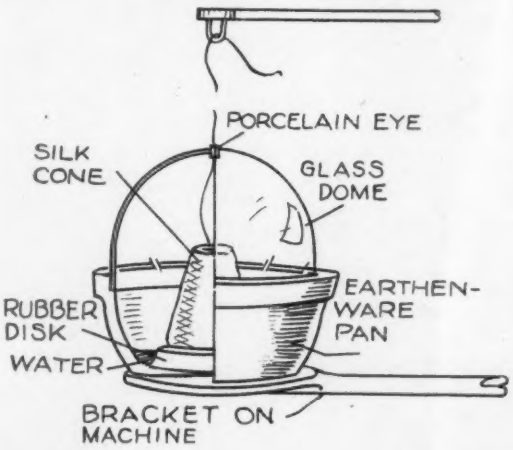
G. N. (N. C.)

Running Multi-End Silk on Hosiery.

EDITOR COTTON:

I am contributing this article to describe the latest way I have discovered to obtain the best results in running and knitting 5, 8, 10, 12 and 15-end silk in making ladies' and men's hosiery. Sometime ago I gave my method of running rayon, the letter being published in the February issue of COTTON under the title, "Knitting Rayon Without Oil Treatment". Since the article appeared I have inquired around and have been informed that several mills have adopted the idea, so I think the "Knitting Kinks" department is well worth the space.

Now, with regard to running the silk, I have added an extra oil jar on the machines. This is the oil jar the Banner machine manufacturers equip the machines with to soften the yarn for the heel and toe operation. Instead of using oil I filled this jar with rain water, and ran the silk over a wick which was in the jar. For a while I thought it was just the thing for the silk was moistened and in fact damp, and it surely knit a tight and even fabric without a cut, which running dry silk that tight would cause.



But after a while I discovered that the continued use of this method would soon cause rust on the machine, due to the silk throwing off a fine spray of water, and sometimes getting so wet that it carried the water down into the needles and sinkers.

I have since improved the idea to the extent that I am on the right track now. I secured an earthen pan about eight inches in diameter and fastened it on the machine over the yarn bracket and cemented the hole with a mixture of putty and slack. Next, I made a rubber disk large enough to support a cone of silk, and about 1½ inches thick. This I placed in the pan. Then I put water in the pan, about one inch deep, just enough to take in the paper cone so it would get soggy and wet. Next I secured a glass dome and drilled a hole in the center and put in a porcelain eye, so the silk would pass through freely. This glass dome was about ten inches high and resembles an Eskimo igloo, but I find this keeps the silk damp at all times and

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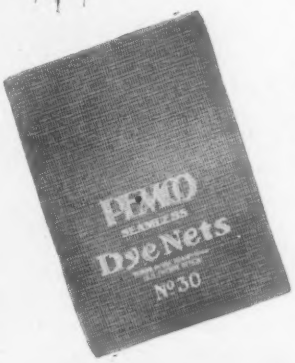

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does not rust or carry water into the needles and sinkers.

The accompanying sketch will give an idea of the moistening arrangement. The pan should have an off-set about an inch from the top and about ¼-inch wide, so the glass dome will fit down into the pan that far to keep it from falling off.

S.M.(WIS.)

Causes for Crooked Stockings.

In a recent number in "Knitting Kinks," "H. Y. (N. C.)" asked what will cause a crooked stocking, a stocking with a twist in it, on a Model K machine.

To begin with, I wish to state that there are some very good suggestions on this point in the Knitting Kinks Handbook No. 1 on Scott & Williams K machine, which is given with a year's subscription to COTTON. If "H. Y." does not have a copy, I suggest that he get one.

My experience on a large group of Scott & Williams Model K machines for the past ten years has shown up very little of this sort of trouble, but those that did get crooked or give a twist, gave me plenty of grief and trouble until we discovered the various causes.

"H. Y." states he found variation in needle length causing some of the trouble. I agree with him on that point, as we have changed needles in various cylinders, at times, resulting in a crooked stocking. It is cheaper in the long run to use needles, sinkers and jacks made by a reliable company. I had one machine in particular which got me stumped. I believe "H. Y." knows what that word means. I had every machinist in the department work on it to get the stocking straight, but to no avail. We had changed needles, sinkers, put on new outside sinker ring, and other things which I will mention later. On this one machine I traced the trouble to the inside sinker ring. In outside appearances, this ring seemed straight and soldered well, but when I took the cylinder out and removed the sinkers and needles, the ring was loose a little on one side. The remedy, of course, was simple. I found this inside sinker ring to be the cause of quite a few crooked stockings. Some of these rings get warped, which will cause the same trouble.

The builders of the machine have recently put out an invention that eliminates trouble from this source. I refer to the adjustable inside sinker ring. Instead of being soldered to the cylinder, this ring is held in place by six set screws. Each set screw has two smaller set screws, the purpose of which is to lower or raise the ring as needed. It can be readily seen that if the stocking is knitting looser on the short butt side than the long butt side, all that is necessary is to raise the ring a trifle on the long butts. The remarkable feature of this device is that regardless of tne lengths of needles, or any other condition on the machine, the stocking can be straightened in a minute.

If the stocking is knitting looser on the long butt needle side than the short butt needle side, check over the left hand stitch cam and see where it is ground square across the bottom. If the outside edge is longer than the edge toward the cylinder, a crooked stocking results. This is due to the long butt needles knitting on the longest point and the short butts on the shorter point.

The left side cam should be set toward the stitch cam as far ahead as possible.

Care should be taken that the outside sinker rings are not loose and are on square. The three pins on the bottom of the cylinder should all measure the same. The yarn tensions should be checked over. There should be an even pull on the yarn.

The slackening cam in the outside sinker ring should be checked over to see whether it is sticking. If it is not out of action in the leg, it will push in on the long butt sinkers, causing the machine to knit looser on the short butt needle side.

If any new cylinder walls have been put in a machine and not filed down to an even level on the bottom of the cylinder, this trouble will result. RYMI.

EDITOR COTTON:

There are several things that will cause a stocking to be knit crooked, or with a twist in it, on a Model K machine. This question was asked in "Knitting Kinks" by "H. Y. (N. C.)."

First, the inside sinker could be raised a little on one side, which is sometimes caused by a new cylinder wall being driven in a little too far, the end striking the inside ring while the cylinder is hot and raising it just a little, which is not noticeable until a stocking is made.

Second, the outside ring may be a little high on one side, which will cause the same trouble.

Third, the stitch cam may be a little higher on the back of the point than it is on the point nearest the cylinder. This will cause the long butt needles to pull the longest stitch. Also, it is possible that the double sole slackening cam is being held in a little, which will cause a longer stitch on the short butt needles. R. V. P. (TENN.)

EDITOR COTTON:

In answer to "H. Y. (N. C.)," who is having trouble with stockings coming off of Model K machines twisted or crooked. He did not state in his question, which was published in the July number of COTTON, what kind of yarn he is running, but I judge it is a two-ply. One fault I have found with certain yarns is that it is not always the machine that is the cause, but the twist in the yarn has caused the hose to be curled or crooked.

The yarn with too much twist per inch and too dry will cause the yarn to twist. To overcome this trouble, the best remedy is to steam the yarn in the package, leaving it in the container long enough to counteract the twist.

I have found that running yarn over wax (paraffin) will work wonders in making the yarn run better. Running the side cam up as close as possible is another good point; do not allow too much play between the side cam and the stitch cam.

I am inclined to think that the fault is in the yarn and not the machine. "H. Y." might try running the main yarn through a compensating tension. The machine builders furnish them and they use them on the B-7 machine for plaiting purposes, and they help with kinky yarn. I would try one of the machines that makes the most crooked hose, and put on a soft twist yarn and see whether the yarn is at fault.

In addition to the foregoing, a point in regard to making a spiral effect in a hose from a 240-needle, 54-gauge Model K machine has come to my attention on different occasions. On the sinker spring band that holds the sinkers in place, there appeared one or two open spaces in the band allowing the butts of the sinkers to get into these

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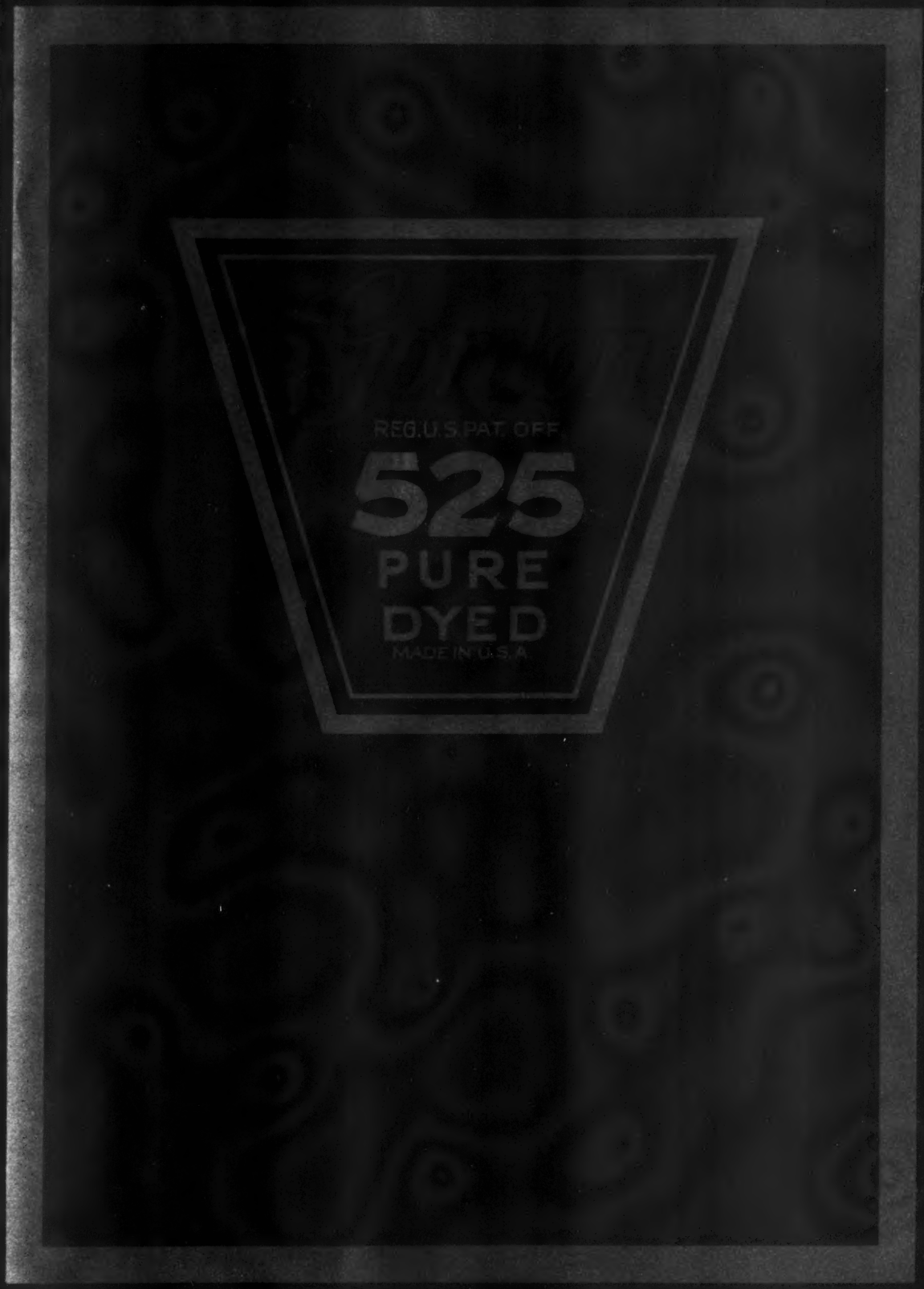

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openings, which made a diagonal line or spiral effect and which produced a twist in the fabric. This might be of interest to "H. Y."; he may be using too coarse a sinker band on his cylinder sinkers.

CONTRIBUTOR No. 778.

EDITOR COTTON:

What makes a crooked stocking—that is, a stocking coming out of the machine with a twist in it? This was asked by "H. Y. (N. C.)" in a recent issue in "Knitting Kinks."

One thing I have found to cause this is a stitch cam long on the back side, pulling the long butt needles down lower than it does the short butts, thus making a looser stitch on one side.

Another thing that can be easily overlooked or passed up is for the inside brass sinker ring to become loosened from the cylinder. It is very difficult to detect this, however, and it should be watched for closely. The remedy is to clean out all of the old solder and put the cylinder in a vise, placing a board to cover the brass so the walls of the brass will not be bent, and press it up tight so it will be the same all around, and then run the solder in there and solder it.

One other cause might be in the outside sinker ring becoming loose, the remedy, of course, being to tighten the clamps which hold it. C. B. (N. C.)

Women Operators on Full-Fashioned Work.

EDITOR COTTON:

On page 945 of the July number of COTTON the subject of women operators on full-fashioned machines was discussed. As this phase of the new southern industry is of interest to all those engaged therein, it will be worthwhile to hear and see what the reactions to such a discussion will bring out. Certainly it will at first appear to be a vital factor in all new development in this field of manufacturing endeavor.

It may not be generally known, but the employment of women as full-fashioned knitters was tried as an experiment about twenty years ago by a large operator of seamless knitting mills in the Central Atlantic states, his idea being based upon the oft-repeated statement that "he could not see why high-priced skilled men had to be employed to run full-fashioned machines." The territory selected for the experiment was in the mining region of Pennsylvania, where many of the residents were of the Central European type and the women were known to be robust and thoroughly acquainted with what we term real hard work, and if our memory serves us correctly, two sets of machines were used; six leggers and two footers. An experienced man, a Philadelphia knitter of my acquaintance, undertook the task of teaching women how to operate the machines. After two years of attempted operation of this double set of machines, the upkeep expense of which absolutely overshadowed any possibility of their being operated at a profit, coupled with the fact that several of the women were said to be internally injured, the plan was finally abandoned and the machines were sold for a few hundred dollars apiece, their condition then necessitating a complete renewal of all needles and a thorough overhauling, after which they were used by a Philadelphia manufacturer for about six years and then junked.

That, as near as I can recall, is the history of the first attempt on this side of the Atlantic to operate this type of machinery by women.

The problems involved then would, to a great extent, still apply, and although mechanical assistance in the "setting" of the machine would help, a great deal of the setting of the machine would call for main strength in order to have the machine in exactly the proper positions to allow for turning welts, breaking out ends, making carrier changes, correcting faults in the narrowings, turning backwards as well as forwards being necessary in order to have the machine show up the trouble. All of these movements could not very well be made by ordinary mechanical appliances in a really practical way.

The problem of needle pliering and squaring might be overcome by intensive training of women, or experienced full-fashioned knitters might be employed to look after the needles and bars of several women operators. But at present the type of knitter that would be competent enough for this work would not be available without the mill facing the fact of costs for such skilled men, and the advisability of adding such a burden to the overhead, because we would have to put them on the payroll as non-producers. This would very easily overcome whatever might be saved in the scheme of employing women to operate the machines. No one doubts that the employment of skilled knitters as sub-foremen over sections would be a highly expensive way of jumping from the frying pan into the fire, and unless the needles, points and bars are kept in condition by someone skilled enough, another phase of the financing would be apt to develop. The charge for depreciation would have to be materially increased, because the condition of the vital points mentioned determines the value and the life of full-fashioned knitting machines, and vitally affects the sale of the goods due to their effect upon the appearance of the fabric in the finished goods.

Granting that women could learn and develop the ability to perform many of the duties the men perform, employment of women is out of the question so far as the handling of the present type of machine is concerned, although we may be able to see some possibility of this change should we adopt for the woman knitter a lighter type of machines of ten or twelve sections instead of, as at present, twenty and twenty-eight sections. These machines as suggested would be more easily handled and set, if the other problems mentioned were overcome by training. It is quite probable, however, that the cost per head would be higher, due to the fact that many of the operating units on the machine would cost as much to build for the twelve- as for the twenty-eight section machine. I refer to such units as the Coulier cam and its relative parts, the shogging cam and narrowing mechanism, the friction equipment and the plaiting attachments. These are some of the important units per machine that would be involved in the additional cost per head for the machines with a smaller number of heads to a machine.

This article is intended to be read and discussed with the sole question in view of cost of operation per dozen manufactured, plus maintenance of the machines in such condition that the life of the machine would not be shortened to such an extent that a higher rate of depreciation would have to be taken into consideration. Female operation of full-fashioned machines may be in the future, but much remains to be done before that promise can be

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Certain qualities inherent in Standard Mercerized Yarn make it pre-eminently the yarn for progressive textile mills.

Lustre, strength, uniformity and evenness are features which meet the requirements of the textile industry exactly.

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SPINNERS MERCERIZERS GASSERS BLEACHERS

STANDARD
MERCERIZED YARNS

realized; meanwhile, methinks the present problems are sufficient for the average manufacturer in this field.

CONTRIBUTOR No. 784.

Preventing Oil Spots on Hose.

EDITOR COTTON:

Oil spots on the instep of seamless hose, and in the gores of the heels and toes, are brought up by "Contributor No. 4256" in the June issue of "Knitting Kinks". He states these are the direct results of cleaning out the cylinders, filling them in with new needles and sinkers. He says he cleans the cylinders with gasoline, and that the needles have no oil except a little on the butt for lubrication. He understands, according to his letter, that these spots are caused during the process of knitting the heels and toes, the up and down movement of the needles seeming to collect the oil and leave it on the stitches in lines.

In my opinion, such oil lines or spots are caused from using a poor grade of oil, rather than from any incorrect method of using it. He said his theory is that the oil he uses carbonized, in my judgment this carbon is caused from the parts of the machine rubbing together while in operation. I would suggest that he get a good grade of oil, such as White Rose, and clean the machine well and then wash it out with this oil, putting it on until the heel and toe do not show black. Then get a small air gun similar to that used for fly killing liquids or other disinfectant, and spray the machine two or three times a day. I do not believe any black spots will show up, and I know this oil will boil out.

M.W.(N.C.)

Conditioning Rayon Yarn for the Winders and Knitting Machines.

EDITOR COTTON:

You have published lately in "Knitting Kinks" some discussion about conditioning skein rayon for the winders and knitting machines, and I am taking the liberty of telling you how we do this, for two reasons: First, so that it may be of help to anyone experimenting along this line, and second, so that if anyone has a better method, he will describe it for "Knitting Kinks."

We get our rayon in ten-pound packages. We have built a galvanized tank or tub about 2x3 feet and about 30 inches deep, which fits into a wooden truck we had made for the purpose. We put the rayon in this in bags and use a conditioning solution of two-thirds kerosene and one-third commercial olive oil. It soaks here for forty minutes, and is then extracted for twenty minutes, and we leave ten per cent oil in the goods. We reclaim the oil from the extractor to be used again.

We find this method to be satisfactory, and also find that by increasing the proportion of kerosene to two-thirds, we secured just as good results as using a fifty-fifty mixture of olive oil and kerosene, and it is considerably cheaper as everyone knows.

E. K. (N. C.)

Booklet on Tubize.

Tubize Artificial Silk Co., of America, 303 Fifth Ave., New York City, have prepared a booklet describing Tubize yarn and discussing its many applications and uses.

. . . . to improve fabrics with absolute safety—to save labor and material . . . .

FORTY-FOUR years ago, with these thoughts in mind, we started to produce treating and finishing products for the Textile Trade.

Today, the Zurn-Quaker City Chemical Co. complete line, is universally recognized as the standard of uniformity and safety, and the most economical for the improvement of Fabrics in Silk, Cotton, Wool and Artificial Silk.

Through all these years of constant contact and work with the Textile Industry, we have pioneered in many of its technical developments and saved countless mill owners both time and material.

Your troubles will be welcomed by our experts who will *gladly help you with your Treating and Finishing problems.*

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Canadian Plant
Birmingham St. & Whitfield Ave.
Hamilton, Ont., Canada

Southern Warehouse: Chattanooga, Tenn.

The Yarn Market

Philadelphia, Pa., August 15th, 1927.

Taken all in all, the fundamental situation in the Philadelphia cotton yarn market for the past month has shown a consistent improvement from the angle of basic conditions. For the first time in quite some time, there was a sustained rise in the price level—both asking and trading values—and the amount of yarn turned over through this market during this period was, indeed, very satisfactory. The picture is one of a healthy condition for an active Fall market. This situation is fundamental, but of course there were other factors having an adverse bearing upon any prospects that might be too roseate for the market.

The first week in the month ending the middle of August, when this is written, opened auspiciously for the spinning division, with a strong condition prevailing and improvement in inquiry, together with a boost in rates, being experienced by carded yarns, particularly those for the knitting trades. This was felt to indicate a lack of forward supplies of this type of yarns as one result of the mid-year inventories; and by the same token, an evidence of more plentiful stocks in the combed and mercerized varieties prevented their sharing to the limit this more prosperous situation prevailing with the coarser counts. There was, however, decidedly more color in the situation, and it was very apparent that a change was occurring from the dull, lethargic condition of summer, with a decisive deadlock existing on both sides of the market—when, in truth, any interest was engendered from either camp.

The next week brought further satisfaction to the sellers of carded yarn numbers, who saw carded weaving yarns, for the first few days, exhibit exceptional strength. There was, basically speaking, a much stronger foundation under the market for all dealings. It appeared that the market was losing the influence of factors selling yarn at sufficiently lower prices than quotations to demoralize the price situation. This seemed to come as result of a continued firmness on the part of spinners, rather than directly because of buying impetus, because in the face of apparently influential conditions, buyers remained away from market to a large extent. This continued attitude of apathy was not comprehensible to dealers who pointed convincingly toward the prospect of a small crop; a heavier weevil infestation; an improved situation in the cotton goods business; and actual advances in cotton values, etc. The explanation was offered that the strong stand of the spinners was disconcerting and confusing to the buyers, and that, anyhow, they wanted to await the government condition report coming during the first part of August.

A continued strong condition for carded yarns prevailed to usher in the third week, which also brought the market into August. A survey showed that these numbers encountered August on an average of three cents higher than their level before the spinners, aided materially by an increasing cotton market up to that time, had been able to help things from their standpoint in moving prices upward. Along with the continuance of this condition came an ability on the part of the combed varieties to hold their stronger position. It seemed that the spinners were reasonably well ahead on orders and kept able to dispose of surplus stocks of yarn when, as, and if these seemed to threaten to drag the market. During this week a slump occurred in cotton, but yarn rates held up in the face of the break, and later in the week continued to ignore further recessions in cotton market values. The main theme of this week was an anticipation of the government's first crop report. There was, nevertheless, improved inquiry for Fall deliveries, giving an indication of the buyers' price ideas, and better business in actual transactions, particularly in carded counts.

The extremely bullish report threw the yarn market into a turmoil on all sides resulting in a deadlocked situation during the fourth week in the month, which has just passed. Dealers promptly withdrew prices, and all hands seem now content to await the settling down of things before either bidding or quoting on yarn prices. From the standpoint of the spinners, it seems that they are so situated as to orders that it will not be necessary for them to rush immediately into quotations, as their bookings now will carry them well into the period when the cotton market and yarn market will straighten themselves out.

Prices on the Philadelphia market on August 15th, reflecting the substantial general gain when compared with the figures published last month, follow:

Single Skeins.

4s to 8s	30	10s	31
12s	31½	14s	32
16s	33	20s	34½
24s	36	26s	37
30s	39		

Single Warps.

8s	31	10s	31½ @32
12s	32 @32½	14s	33 @33½
16s	34	20s	34½ @35
24s	39 @39½	30s	40½
40s	49 @50		

Carpet and Upholstery Yarn in Skeins.

8s 3-4 hard white warp twist	28½ @30
8s and 9s tinged tube	27 @28
8s 3-4 hard twist waste	26 @27

Two-Ply Skeins.

8s	30½	10s	31½ @32
12s	32¼	14s	33
16s	33½ @34	20s	34
24s	36	26s	37 @38
30s	39 @40	40s	49 @49½

Two-Ply Warps.

8s	31 @31½	10s	32 @32½
12s	33 @33½	14s	34 @34½
16s	35	20s	35
24s	38	26s	39
30s	41	40s	49 @50

Frame Spun Carded Yarn on Cones.

8s	30½	10s	31½
12s	32	14s	32½
16s	33	18s	33½
20s	34	22s	35
24s	36	26s	37
30s	39	40s	48
30s double carded	40 @41	30s tying	37½ @38

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	43	20s	46 @47
24s	48 @50	30s	52 @54
40s	60 @62	50s	66 @67
60s	74 @76	70s	85 @87
80s	95 @100		

Single Combed Peeler Yarn on Cones.

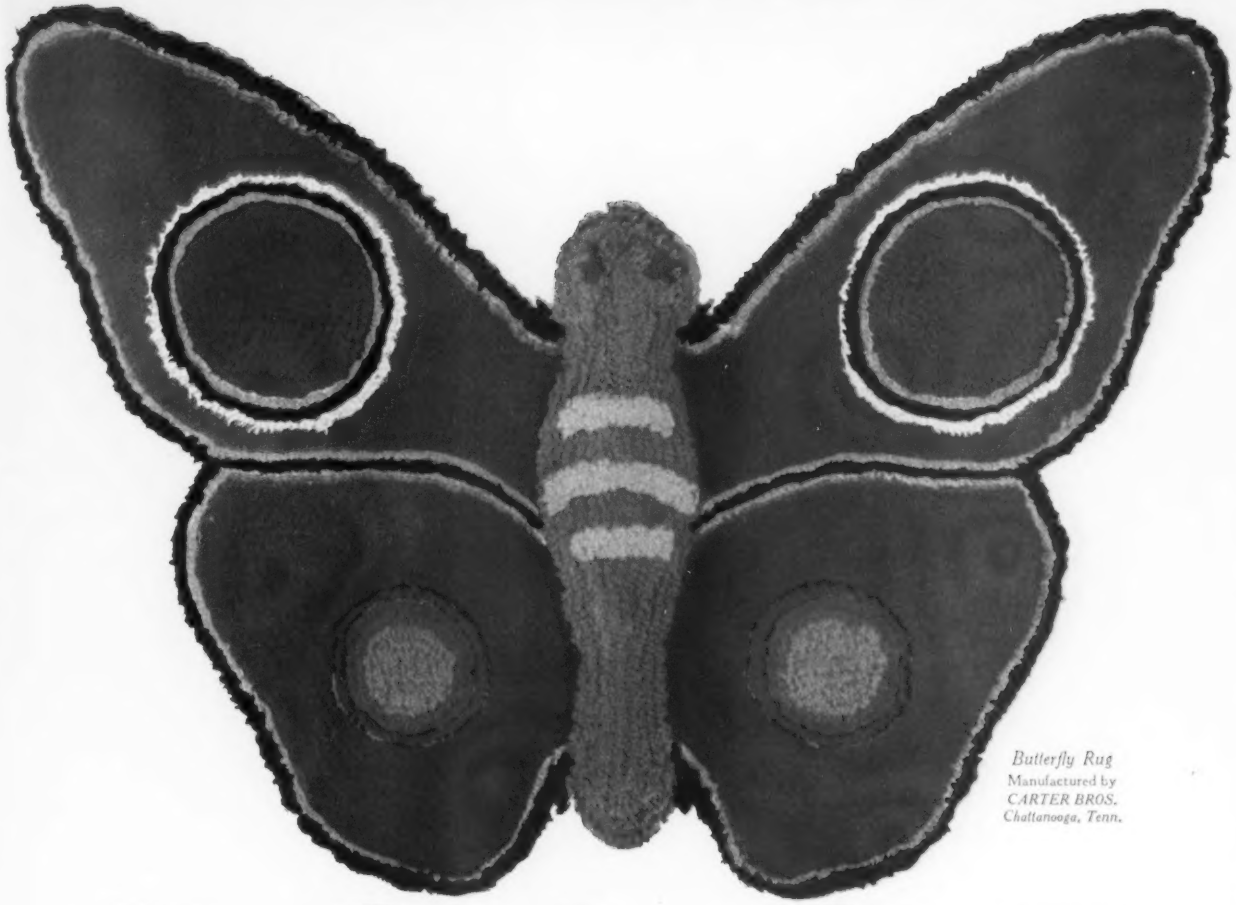
18s	45	24s	48 @49
30s	53	36s	55 @56
38s	57 @58	40s	59 @60

Mule Spun Carded Yarn on Cones.

10s	34½	12s	35
14s	35½	16s	36
18s	36½	20s	37
24s	38	26s	39
30s	41	40s	51

Mule Spun Combed Peeler Yarn on Cones.

10s	45	12s	46
14s	47	16s	48
18s	49	20s	50
22s	51	26s	52
28s	54	30s	55
36s	58	38s	59
40s	64		



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Manufactured by
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COLOR

-the Master Salesman

CARTER BROTHERS of Chattanooga, Tenn., have built up a splendid business in yarn-dyed washable rugs.

These rugs are of a novel, patented pile construction, providing excellent sales arguments, but the feature that gets attention and creates desire is the colors,— bright, harmonious, even, solid shades.

Franklin Process Yarn Dyeing Service has been selected as standard for this work for the following reasons: —

1.—The pressure method of dyeing assures the thorough penetration of the color so necessary in the dyeing of pile yarns.

2.—A large yarn dyeing capacity and a wide range in sizes of machines assures prompt delivery on all dyeing orders, large or small.

3.—An efficient laboratory equipment makes it possible to create new shades quickly and economically to meet the changing demands of the market.

4.—The Franklin Package is the most convenient and economical form in which to handle the yarn.

Franklin Process Service can deliver dyed yarn on parallel tubes of any standard size, on cones or on cops, thus saving the customer the cost of extra winding equipment. It can also assist in a merchandising way, not only suggesting appropriate shades and attractive combinations, but also suggesting factors in the market interested in a given product.

Can COLOR increase your sales? Let us assist you in answering this question. Mailing the coupon will not obligate you in any way. Do it NOW.

A FRANKLIN PACKAGE of dyed yarn. It will deliver freely either rotating or over end.

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Largest Job Dyers of Yarn in America
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Greenville, S. C.

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Chattanooga, Tenn.

FRANKLIN PROCESS

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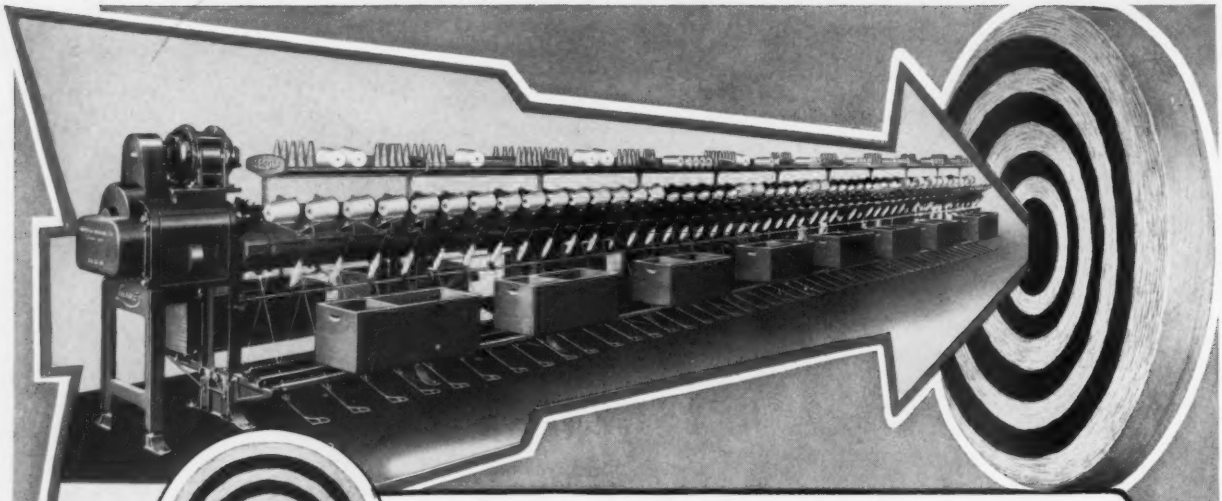

Another Bull's Eye,

No. 60 GF LEESONA UNIVERSAL WINDER

LIKE many other Leesona products, this machine is an outstanding achievement of good marksmanship, but in its creation straight shooting has been supplanted by straight thinking, plus the highest type of technical ability and craftsmanship.

It is distinguished by high operating speed, low power consumption, exceptional durability, and uniformity of product. Because of its high speed it also naturally requires less floor space for a given production than ordinary spoolers or winders. It requires less than 3 h. p. to operate one of these machines with 98 spindles at a yarn speed of from 450 to 600 yards per minute.

This winder is particularly adapted for winding yarn onto cones for knitting, and onto parallel tubes for shipping purposes. Perhaps its most noteworthy function is the preparation of supply for the Leesona Universal magazine cone creel that is used to feed modern high-speed warpers. Its high winding speed, combined with its self-threading tension and foot start, makes it possible to obtain the greatest production at the lowest labor cost.

If you have a coning, tubing, or warping problem, this machine merits your careful investigation. You can obtain the complete story by communicating with any one of our offices. Ask a Leesona sales engineer to call, study your requirements, and make recommendations. Your request will not obligate you. Use the coupon now.

THE LEESONA TARGET.

"The Solution of Every Winding Problem"

Two essentials to success in any business are a clearly defined target and an unwavering aim. A third of a century ago the Universal Winding Company established for itself, as a goal or target, "the solution of every winding problem."

Since then this Company has built over 2,000,000 winding spindles and marketed over fifty different kinds of winding machines. Many of the originals are still the only outstandingly successful mechanisms of their kind on the market.

This Company is at present the largest organization in the world making winding machines exclusively. Supremacy in size is the logical result of supremacy in demand. Supremacy in demand follows leadership in conception, execution, materials, and service.

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UNIVERSAL WINDING

UNIVERSAL WINDING CO., - C
Providence, R. I.

Gentlemen: Please send us information about winding
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The Knit Goods Market

Improvement in the knit goods market is seen as preparation for the fall season gets under way. The summer quiet in hosiery served a good purpose, in being the cause for restricted production, and the movement of some cumbersome stocks of various types of women's full fashioned and silk seamless and fancy half hose, of all of which, howthere appears all that is ample for meeting consumptive demand. Infants socks, which seem to have been offered unduly early for next year, were draggy throughout July, but were bought more freely toward the middle of August. The situation as to wool hose, for men, women and children, is fairly satisfactory, with many jobbers placing reorders.

Underwear has been showing better than average midsummer activity, light weights for the next season having had a better start than many factors looked for. The outlook for absorbing interest in 1928 bathing suits is somewhat disappointing. To offset this there is considerable stir in sweaters, most mills being well supplied with orders and their busiest session still ahead of them. The second half of the year has started better than the first half finished.

Hosiery.

While there is nothing particularly outstanding in the revival in women's silk hosiery, it appears manufacturers found warrant in August for increasing output of both full-fashioned and seamless. Mills making the latter, report orders coming more freely for immediate and nearby deliveries, and no goods of moment in stock. Four Pennsylvania mills from which first hand information has been obtained are operating day and night. This is not so significant as might appear, as with each overtime schedules have prevailed for some months. Two are in Reading and one in Philadelphia, the fourth being in the central part of the state. Their product is pure thread silk and silk plaited on rayon. One sells direct to retailers, the others to jobbers. Neither selling policy, therefore, can be held as accounting for the activity in these several establishments, which are by no means representative of conditions in northern mills generally.

One thing that is apparent in women's seamless hosiery is that it is being removed from the dollar-a-pair class, even as to latch needle construction, in no little extent. This is indicated in the reported volume of business taken by the Davenport Hosiery Mills for its Blue Crane brand. The resale price as suggested by the manufacturers to retailers is $1.19. The Blue Crane hose represents a radical departure from the standards of most manufacturers, however, and is nationally advertised to distributors and consumers. This accounts in some measure for the reception accorded to the line, no doubt, and may dispose of the theory that it is price that sells hosiery.

A manufacturer said the other day that if he could sell women's full-fashioned chiffons to retailers for $10.50 a dozen he would have to double his plant to take care of demand. "Assuming your competitors would meet such a price, do you believe your volume of sales would be much larger than at present?" he was asked. He thought not, stating the $10.50 price would not help him much unless it were lower than competitors' quotations. About the time this conversation took place the Quaker Hosiery Co. came out with a case lot price of $11 a dozen to retailers, for a line described as all silk service sheer, which means, probably, it is of six or seven thread silk. The result will be watched with no little interest in the trade.

Style is a more potent factor than is price in volume sales, is the opinion of another manufacturer, leaving out of consideration circumstances that arise in an oversupplied market and lead to extraordinary competition. Not so long ago, when chiffons were more a craze than now, the mill was stocked with eight thread silk hose, the manufacturer related. The number was taken out of production for the time, as it seemed impossible to move it profitably. Subsequently there developed demand for eight thread and the manufacturer had no difficulty in moving his holdings, at the established price. He may have done so opportunely, for at the moment it appears seven thread of 42 gauge ranks well up in popularity. Style sold the eight thread and style is selling seamless hose, although, obviously, not proportionately.

A manufacturer participating in the uplift for seamless silk has brought out a line knitted 36 inches long, of all-over silk. It is understood the retail price will be not under $1.50 a pair, probably more in some shops. The stocking is an innovation in the seamless division, but 36 inch hose of full-fashioned construction preceded it by a month or two, introduced by the Harron Hosiery Mills and reported finding good sale. The Strahan, another Philadelphia mill, had previously put on the market a 33-inch stocking. "Longfellows" is the copyright name given to the Harron 36-inch as being an appropriate trademark for a companion piece for the short skirt.

While jobbers had their hardest session in the first quarter of the year, when hosiery was going to retailers more slowly for summer than had been in the case in previous years during the corresponding period, there is manifest much concern over the large offerings of some leading department stores at prices that spell loss somewhere and denote the existence of heavy distress stocks. A Philadelphia store in August had special sales of an aggregate of more than 55,000 dozen pairs, with firsts of 20-1 inch boot priced 75 cents, and silk to narrow welt as low as a dollar a pair. Similar sales were held in other cities, and made the Quaker Hosiery Co.'s price of $11 a dozen seem high to distributors.

The jam had its beginning in the first three months of 1927, when mills were producing as usual despite jobbers were doing comparatively little buying. Then, too, staples suffered during the craze for the black and otherwise contrasting heel novelty. By the time this fad began to disappear the market was oversupplied, and subsequent curtailment, while proving helpful, has not been sufficiently severe to bring about a well balanced situation.

It seems not improbable there will be another period of restricted output, forced, perhaps, by circumstances, for numbers of Philadelphia mills are believed to have taken

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steps for inaugurating the open shop policy, which would likely be resisted by the organized full-fashioned workers. It is urged that something has to be done for eliminating the wide disparity in wage scales and that operating cost must undergo adjustment.

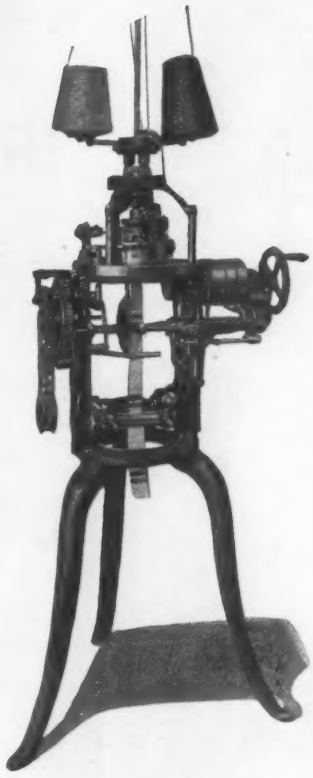
A manufacturer in a town suburban to Philadelphia is having one knitter, with helpers, operate four machines, and the machines are active 24 hours a day, knitters working 12 hours. By this means the manufacturer has materially reduced his cost of production, while the knitters draw more money per week than those employed in closed shops. Another mill in which machines are run continuously for 12 hour shifts employs one knitter and a helper on each two machines, and also is effecting a considerable saving. It appears the operatives thus engaged are eager to hold their jobs even though members of the union, and as they are skilled mechanics their services are desired by their employers. The success of a few mills maintaining this policy has inspired others to undertake its installation.

As there are many knitters applying for work, it is felt that it will be no difficult matter to have open shop mills manned by operatives who may be union or non-union men. Whether there will be open resistance on the part of the organized operatives remains to be seen. But in any event there seems likelihood of some shutting down pending arrival at a complete understanding on the question whether manufacturers are to run their plants on a more economic plan than that at present in vogue in a majority of the Philadelphia factories. The effect on the hosiery markets in the meantime is problematical. As is pointed out, lower operating cost might mean lower prices to the trade, while on the other hand a cessation of operations would be likely to cause a scarcity of hosiery for such deliveries as distributors have been educated to expect.

Hosiery style may play an important part in the manufacturing campaign. Retailers are calling for novelty heel construction. They complain the markets are devoid of snap, with practically nothing but staples available. It is anything to get away from the square heel and circumvent the pointex, the rights to which appear to be controlled by the Gotham company, so far as relates to full-fashioned hose. A variety of novelty heels is being offered, but none has taken hold in a satisfactory way. If a goodly proportion were to be adopted, the square heel would occupy a distinctive position. Most manufacturers hold to the theory that for a long and safe pull staples are the better guess.

As between the mills selling to jobbers and those distributing directly through retailers, the latter appear to be in the more satisfactory position. Some, however, could accommodate more business. But, generally speaking, all have a steadier and more dependable flow of orders than most mills selling to jobbers, and did not curtail so sharply. Their quicker delivery service is a big factor in a more nearly continuous movement of goods to retailers.

If there is a drift to ingrain silk hosiery it is not apparent in the plans of manufacturers other than the comparatively few who for some time have been knitting from dyed silk, and it is not in evidence that they are expanding their facilities. Numbers of specialty shops would like to exploit ingrained hose, but realize they could not get the prompt delivery service that is supplied in the dipdyed. A Philadelphia manufacturer of the latter is importing ingrain hose, of 54 gauge, from Italy, and declares he will not knit



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We will gladly send you full information of our complete line.

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3700 Kensington Avenue Philadelphia

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South America: Santiago Scotto, 15 de Novumbre 1899, Esq. Pozas, Buenos Aires, Argentine Republic.

FOREIGN AGENTS.

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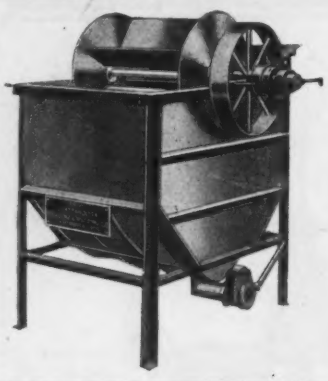

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Prices quoted on application.

Special tanks and linings of monel, lead and copper built to specifications.

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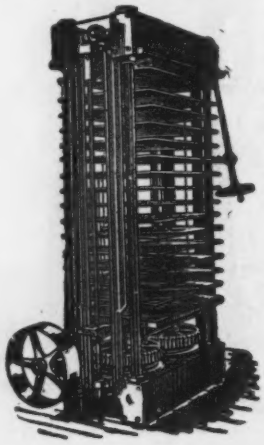

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Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

it, mainly for the reason it could not be produced safely in volume. A unit of 54 gauge machines has been installed in an upstate Pennsylvania mill, which gave rise to a belief ingrain was contemplated. What is more likely is that it will be used for three-thread silk dipdyed.

Buildings for a full-fashioned mill are being erected in Denver, a Lancaster county, Pa., town, to be owned and operated by an intended corporation, the name of which was not disclosed, at last accounts. It is the understanding in the community the enterprise is backed by Daum-Roger-Spritzer Co., New York jobbers. It seems to be increasingly difficult for jobbers to compete with manufacturers selling to retailers, except they also are producers, and it is pointed out that the large distributors who in recent years have entered the manufacturing field did so with much success. But they continue to be among the more desirable patrons of some of the leading mills taking no part in distribution among the retail trade.

While practically all jobbers are committed for deliveries of wool and wool mixture hose, there has been a hesitancy to operate as extensively as in recent years. Generally speaking, initial orders ran small, according to various manufacturers, and necessarily there has been some reordering. But it is stated the repeats plus initial do not represent a satisfactory total. Wool in combination with rayon appears to have been taken more freely, for the moderate price brackets, in children's. As to the latter, there is heard much complaint by manufacturers other than those having especially attractive patterns and a clientele that sticks year after year.

Moderate price golf hose for boys apparently has taken the place in no little extent of wool lines, and misses seemingly are less partial to wool, since fancy patterns in low price construction, jacquard and otherwise, have come on the markets in increasing quantity. The Penns Valley mill, in Central Pennsylvania, is and for some time has been steadily engaged with children's and boys golf hose, not infrequently operating day and night.

Men's fancy half hose in wool mixture continues in fair demand, jobbers placing reorders in a restricted way, however. A few mills have sold their production to around the middle of October, and of certain lines there is seen probability of a scarcity late in the fall. Some manufacturers are producing only for orders, and will have no stocks from which to make immediate shipment against late orders. This plan is coming to be practiced more generally as jobbers further their policy of making storekeepers of manufacturers.

In one respect manufacturers of infants' socks have had a repetition of the experiences of former years when openings for the next succeeding season were premature. Prices came out formally on July 5, but all the business booked from jobbers during the month was hardly a drop in the bucket. Buyers were prompt to look at samples and then shop around among the various mill agents. On this occasion, perhaps to their amazement, prices stuck where put, despite the waiting. If any mill yielded the fact did not become generally known. One manufacturer was alleged to have applied the fancy tops of several $2.25 numbers to others quoted at $1.75, and this was regarded as a very clever evasion of the whatever may have been expected as to price adherence. But this plan of circumvention was, of course, open to all, so that no harm was done, from the price standpoint.

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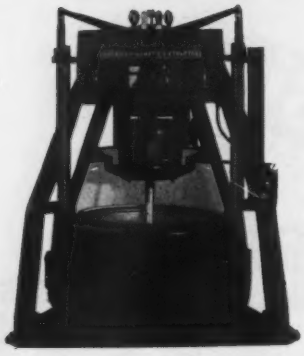

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Manufacturers who specialize in chain store business are understood to have taken a comfortable volume of early orders from two or three such establishments, but it was not until about the beginning of August that jobbers did more than place sample orders. In the meantime considerable sock machinery was idle, one or two important mills shutting down entirely for around two weeks. But as jobbers soon will be offering their lines to the retail trade they have gotten into a better stride, and the outlook is for some real activity for manufacturers.

There is manifest some anxiety as to the status of men's fancy half hose for the next summer season. Several of the better known manufacturers say there is quite a decline in interest in novelties on the extreme order for the half dollar bracket, which has been the life of the fancy sock game for some time. Higher price numbers, of silk and silk and rayon plaited, appear to be holding in favor, and for the comparatively few mills making the very low end there appears steady sale, for an element that revels in color in jazz effect so long as it remains available at a quarter a pair. That type of sock is selling, so that there continues a good outlet for distress goods in the 50 cent class.

It would appear that the question whether fancy half hose is destined to remain popular will have to be debated from a new angle, with jacquard construction making its appearance in distribution in a large way. At least two southern mills, one in Chattanooga, the other in Fort Payne, Ala., a short time ago made installation of the Fidelity multiple design machines, as have a few others. One of the more important wholesale distributors was among the first to contract heavily. The magnitude of this concern, its ramifications among retailers and a revolution in pattern exclusiveness are regarded in the trade as promising big for the jacquard sock. Limitations in design are boundless, and it would be possible to present 50 and more colors in a sock made on the multiple design machine.

Jacquard construction will put fancy half hose in higher price brackets. Some lines will be made with the Hirner patent foot, the talking point for which is that it joins the leg at the right angle. This form, it is understood, will be employed more generally for socks to sell at around $2 a pair and up. Use of the standard foot of commerce will not make the jacquard a cheap sock. It is to be distinctive as to construction and price as well, and the inference is more patrons of novelties will pay a dollar a pair as a minimum, in the assurance the patterns they adopt will be in little danger of becoming commonplace, as duplicating by competing manufacturers will be a more costly proposition than is the case with the fancy as it is in construction which has prevailed for the popular half dollar numbers.

That novelty half hose had reached the waning stage seemed to be indicated in increasing sales of plain color silk split foot lines of a number of the better known mills.

Underwear.

When, in July, numbers of cotton underwear manufacturers advanced their prices for heavy weights there was a disposition among many jobbers to regard the markup more in the nature of a bluff than as an adjustment on the previous rise in cotton, and while contracting received a mild stimulus it did not proceed at a pace warranted by the then prospect of a further advance. The effect of the August 8 government crop estimate necessarily was something of a jolt for the waiting ones.

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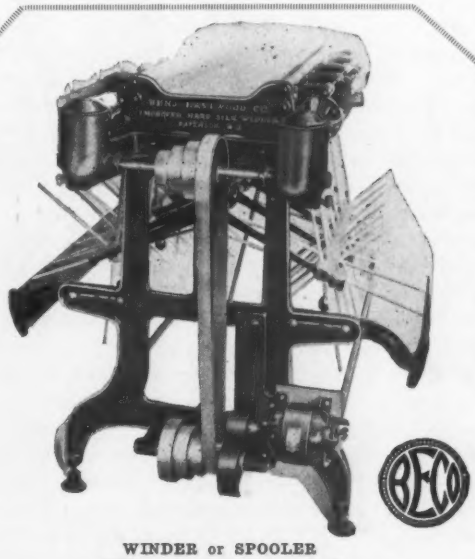

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Jobbers had deferred because retailers were deferring. Whether the latter now will be made to pay the penalty for tardiness in pursuance of the policy for having other interests carry stocks for them will depend on the extent to which wholesale distributors had covered at the lower prices for their season's requirements. Some say they had well covered, but this may be viewed as an attempt to bluff the mills. However this may be, it is a foregone conclusion that those which had advanced prices will have no difficulty in making the new lists cut-proof and that those which had not will have regrets.

Leaders in the southern group of underwear mills were pretty well sold ahead by July and were still booking orders, while up in the Mohawk Valley there was room for considerably more business. Manufacturers in that center now have come into their own. They have lost little or nothing by reason of distributors' previous attitude, except production, for which there would appear ample opportuntiy for compensation. The onus is on the retail trade. The position of manufacturer and jobber was strengthened for the remainder of the season, and as was the case in several recent years, the better margin of profit should be on the late deliveries, of which there is promise of a considerable volume, as doubtless there will be reluctance among merchants to accept the crop estimate as approximately final.

Manufacturers of cotton fleece underwear were the last to advance prices, none announcing increases until toward the end of July, when there remained much business to be placed. Fleeces were no less inactive after the rise than before, but immediately cotton jumped to the unexpected level there was revival of jobber interest, as further upward revisions were looked for.

Two views are heard as to the wisdom of most manufacturers of men's light weight cotton underwear naming prices in the middle of July for the next season. One opinion is that all would have profited by waiting, that what little was sold by them was let go at too low prices, considering subsequent developments. Another is that there is certainty that what business was taken will stick, and that mills can go ahead safely with production. Viewed from either angle, the early opening was in favor of the distributors rather than the manufacturers.

Several mills had named specially attractive prices for their balbriggans in the sub-standard class and are understood to have taken all the business they propose to accept at the opening prices. There is indicated a good season ahead for bals. They seem to have scored a substantial gain this year at the expense of nondescript lines of nainsooks. Manufacturers believed they would be better able to hold the ground gained by coming on the market early, and thus far it appears they have been vindicated in that stand. This is admitted by one of the more pronounced advocates of a September date for the light weight opening, and his line, one of the better known in the trade, comprises only ribbed goods, prices for which were named late in July. The market now is set for a lively session, as to both light and heavy weights, with prospects of keen competition between nainsooks and the knitted.

Men's nainsook athletic union suits have been seriously disappointing this season for manufacturers other than those selling standard lines under nationally advertised brands. As has been stated on more than one occasion, the markets were flooded with nainsooks of the coarser cloth, and skimped at that, for a price to meet the notions of a distinctive element among retailers and several of the large chains of stores. The lowest price seen in any store was 25 cents for athletic suits, which obviously had not been cut out of 72/80 cloth, and there were instances of what really were dollar values priced down to a half dollar, for special sales.

It is a trade opinion that it was heavy over production of nainsooks rather than an increased use of bal briggans that accounts for the large distress stocks indicated in a slaughtering of prices by both manufacturers and dealers. It is, however, the testimony of a large manufacturer of both nainsooks and knitted light weights that the former declined in demand this year. This may be ascribed in part to the flood of cheapened garments, which necessarily caused a diminution in the sales of standard lines from even the better known mills.

The drastic cut in this season's prices by one manufacturer of a well known brand of nainsooks who came on the market a few weeks ago for 1928 is construed as meaning competition in this division is going to be even keener than this year. The prices of one or two nationally known makers are not looked for until around the middle of September, but no doubt was entertained they would be on a parity with those of similar lines.

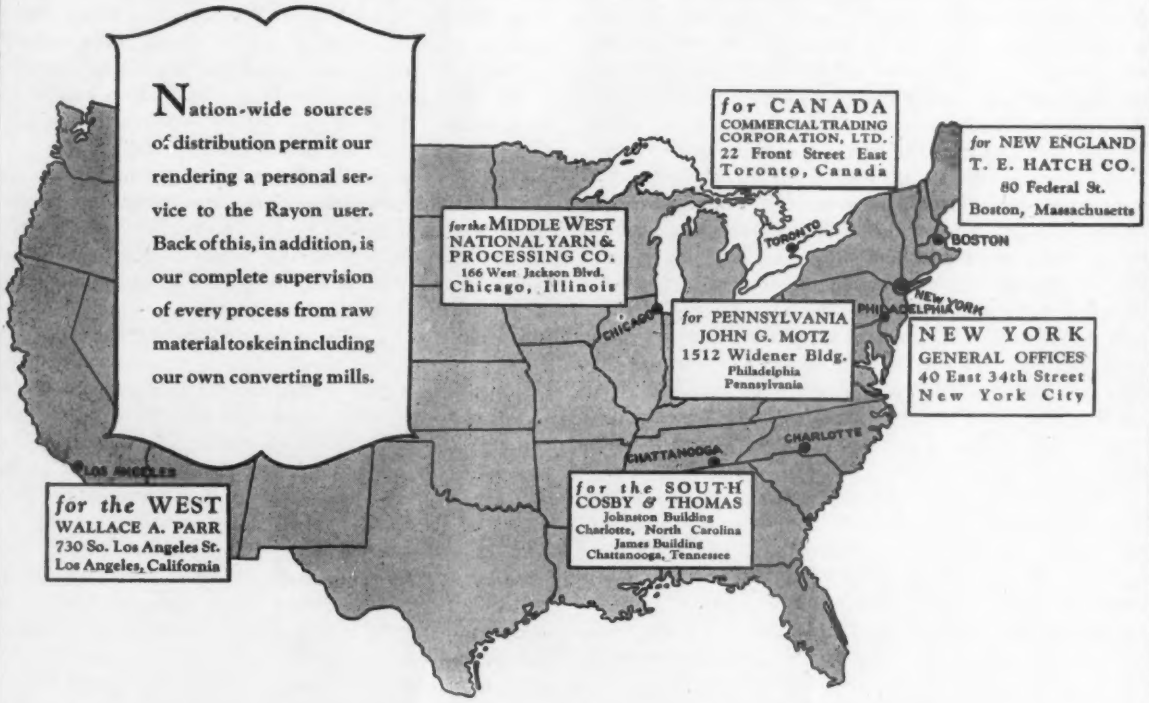
The selling agent for a manufacturer of women's knitted cotton underwear who has represented the line for around 20 years states that a few weeks ago he booked the largest order in the period of his connection with the mill. It was placed by an eastern establishment, and was viewed as indicating that concern's confidence in a revival for cottons notwithstanding a research bureau reports an estimate of 33 per cent of women's underwear is of knitted rayon. The order referred to, it is stated by the mill representative, was for only a part of the buyer's requirements for the season. The buyer has since increased the order, is a further statement.

Most manufacturers in the Schuylkill Valley section of Pennsylvania whose sole output is light and medium weight cotton underwear for women, were operating plants on part time schedules during the between-seasons period. Their sales of summer weights compared favorably with last years' volume, it is stated by leading manufacturers. The same is said to be true of advance business in medium weights. Chain stores and catalog houses have bought as freely as in the past, several such establishments increasing their orders. Jobbers, on the other hand, are operating on their usual conservative basis, except as to some of the larger ones.

Sweaters.

Trading in sweaters becomes more active with the swing from summer to fall, and probably all the business most manufacturers can handle will be offered during the remainder of the production season. Some mills which, during recent months, had difficulty in selling the output of half time plant operation are operating to capacity on orders, and numbers which were on full time schedules have overtime work for all who apply. The leaders in the industry are under pressure for deliveries, and little complaint is heard in any quarter, practically every sweater center reporting busy.

Sports coats is a rather broad term, but nearly every manufacturers says they are the ranking types of coats for men and women. And almost every report dealing with



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demand includes shakers in a variety of collar construction. For women the pullover coat, in sports effect, is a popular garment, but the button up, whether shaker or semi-sports, apparently has the big call.

A new coat for men and juveniles which first went into distribution the second week in August may attain as great a degree of popularity as the lumberjack enjoyed for several years. It is a creation of S. Leibowitz & Sons, operating nearly a half hundred scattered factories, who manufactured lumberjacks on a large scale and are among leading shirt makers. The new coat is trademarked "Aero-Jack," described as an all-weather jacket, windproof and waterproof. It is made from aerosuede, a new fabric said to be controlled by the Liebowitz company, who claim it "sheds water like a duck and stops cold wind like a wall." The coat is sold under an absolute guarantee, at $3.50 for boys and $5 for men, these being the retail prices. It is in a half dozen solid colors, several of which are reserved for boys and girls. It may be said on actual knowledge that the aero-jack met with a whirlwind reception from the retail trade. If it prove as acceptable for rough outdoor wear as did the gaudy lumberjack it will have a cheerless reception in the knitted sweater trades.

Bathing suits for next year are being shown, in fact, have been on the market from a number of mills for several weeks. Results at the opening did not indicate jobbers intended to do much early contracting. The season this year was a better one for manufacturers than dealers, the impression prevailing generally there are sizeable stocks among some jobbers and retailers. Most of the manufacturers are understood to have finished with bare bins.

"Standard Sizes for Knit Underwear."

The Associated Knit Underwear Manufacturers of America, Utica, N. Y., has just published a 32-page loose leaf booklet on "Standard Sizes for Knit Underwear," detailing standard sizes developed during the last two years in cooperation with the United States Bureau of Standards. It includes the plan of symbols for designating different models, and gives the accepted methods of measurement. Each is accompanied with descriptive illustrations. The book then gives standard measurements on different standard types of garments, and also contains the approved washing instructions for rayon knit underwear and wool and wool-cotton knitted undergarments.

The book tells how the organization set about developing standard sizes and measurements, with a view to meeting all needs, and how the standards were arrived at. It also outlines the Association's plans for further standardization work. Copies of the booklet may be secured at 35 cents each.

Liquid Caustic Soda.

A bulletin on the subject of liquid caustic soda has been issued by The Mathieson Alkali Works, Inc., 250 Park Ave., New York City. The purpose is to present facts with reference to changing from solid to liquid caustic soda, and to furnish useful data on approved methods for the transfer, handling and storage of liquid caustic soda, together with notes on the dilution, testing and properties of caustic liquors. It also discusses the question of who may profitably use liquid caustic soda and why. It is called Bulletin No. 275 and may be secured upon application.

Mending Runners in Hose.

Manufacturers of women's silk hosiery are in receipt of letters from the Runner Needle, Inc., a Philadelphia corporation, advising them the company is threatened with a suit by the Stelos Co. of America, Inc., whose runner mending device has been in use for several years, and asking for information which would be valuable in defending a suit. The Stelos implement is said to be a magnetized latch needle. That of the Runner company is described as "the needle with the patent latch spring."

The language of the Stelos letters patent for "an improved method of repairing runs or ravelings in a knitted fabric" makes it appear that the method includes "stretching the fabric over a suitable holder." This may be one bone of contention. A cup or tumbler or almost any cylindrical object of suitable size constitutes a suitable "holder." But if the use of a cylinder is prohibited by the Stelos patent, says the Runner Needle, Inc., a person stretching the fabric over a holder formed by the fingers could not be adjudged guilty of infringement. But the company goes further, maintaining its latch spring, for which a patent is pending, is not an infringement of the patent of the Stelos magnetized latch needle. In its letter to hosiery manufacturers the Runner Needle, Inc., says:

"The Stelos needle is rented to manufacturers at $600 per annum, whereas our needle is sold at $1.00 each. It appears to us that the Stelos Co. of America, Inc., is endeavoring to obtain a monopoly of the mending of hosiery and knitted wear. A preliminary injunction was obtained in a suit against a woman, in Kansas. Fortified by this success, the patent owner will seek to secure other injunctions, and unless such suits can be properly defended a monopoly may be established that will be distinctly harmful to the entire textile industry."

It was with a view to obtaining information for defending its patent that the Runner Needle, Inc., asks hosiery manufacturers for information. Its needles are being used by some manufacturers, it is stated, and by many women, for mending runners in their homes, at nominal cost. The charge in many hosiery repair shops is 35 cents per runner.

Two New Ciba Dyestuffs.

Ciba Co., Inc., have announced two additions to their Neolan series of dyestuffs. Neolan Dark Green B is recommended for fast shades on wool and for leather and lakes. The other new shade, Neolan Orange G, is distinguished from Neolan Orange R by its yellower shade and better fastness to milling, while maintaining the fastness to light and leveling properties, the company states.

Sipp Co. Presents Stock to Employees.

The Sipp Machine Co., of Paterson, N. J., for thirty years manufacturers of silk machinery, and within recent years rayon machinery, have presented each employee of the company with one share of 7 per cent preferred stock at $100 par, for each five years of continuous service. Many of the employees have been with the concern for over 25 years and received five shares of stock. This stock was given gratis, and it is intended to continue the plan indefinitely. The presentation was made recently at a dinner given for all of the company's employees.